Annual Report 2019
Letno poročilo 2019

InnoRenew CoE

Renewable Materials and Healthy Environments
Research and Innovation Centre of Excellence

InnoRenew CoE

Center odličnosti za raziskave in inovacije na področju obnovljivih materialov in zdravega bivanjskega okolja

Annual Report 2019

Letno poročilo 2019

Fraunhofer WKI

Mentored by the Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut WKI (Fraunhofer WKI)

Mentorstvo: Inštitut Fraunhofer Wilhelm-Klauditz (Fraunhofer WKI)

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EVROPSKA UNIJA
EVROPSKI SKLAD ZA REGIONALNI RAZVOJ

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Kazalo

Foreward from the Director of the InnoRenew CoE

InnoRenew CoE's third year brought us closer to our vision of becoming a globally recognized research institution leading breakthroughs in the interdisciplinary science of the built environment. We continue to be successful in building new partnerships with industry and research institutions both nationally and internationally. In this year's report, we emphasize our internationalization activities and presence.

Internationalization drives our mission to "advance the state of the art and achieve scientific and innovation excellence through interdisciplinary science, especially in our two key research areas: wood modification and restorative environmental and ergonomic design (REED)". Sharing our work globally leads to scientific, economic and social impact beyond our borders.

In 2019, we grew by 12, bringing us to 58 employees. Fifty-one percent of our institute's total workforce are international employees coming from 15 countries, including Belgium, Brazil, Bosnia and Herzegovina, Croatia, the Czech Republic, Finland, France, Hungary, India, Italy, Norway, Poland, Sweden, Thailand and the USA.

We held the InnoRenew CoE 1st International Conference, "Timber – A healthy future for sustainable buildings", which I believe will evolve into a well-recognized and attended yearly conference that attracts participants from around the world. Organizing and hosting this event allows us to lead the creation of an interdisciplinary network and initiate new global collaborations evolving from shared knowledge and expertise. We further enhanced these internationalization efforts by registering an open access, peer-reviewed journal, "Interdisciplinary Perspectives on the Built Environment", that aims to publish high-quality research at the nexus of sustainability, health and the built environment.

Our international presence beyond the institute is strong with researchers and staff participating in 58 international conferences over the last year. We remain active in a wide range of international associations as an institute as well as through our employees' individual memberships.

InnoRenew CoE's open culture permits us to host researchers and industry representatives in our laboratories. Our researchers also have the flexibility to undertake research visits abroad to expand on work and build relationships. In 2019, we welcomed 155 international visitors from 30 countries to the institute, 19 of whom joined us for a long-term research visit, while our researchers performed eight research visits at institutions abroad.

We greatly progressed our ambition to closely collaborate with national and international industry. Living Lab InnoRenew, our innovation platform that brings together experts from different fields to address challenges facing the wood-based value chain, grew to 115 members from 28 countries. In addition, we filed a European patent with the Metadynea company, which is the first of many to come. We aim to create more joint InnoRenew-industry intellectual property rights agreements in the future.

We also made great progress in obtaining research grants from Slovenia and the European Union. We submitted over 40 proposals that resulted in funding of nearly €4 million for InnoRenew CoE. Many of our applications are still under evaluation, and we look forward to receiving results that will further emphasize InnoRenew CoE's success in 2019.

InnoRenew CoE outreach beyond the scientific community is of great importance to us; therefore, I am pleased we were the subject of a Euronews video this year that reached greater European society. We also took additional steps to become more visible within Europe by registering the InnoRenew CoE name and logo with the European Union Intellectual Property Office and receiving European Union trade marks for each. Protection of our intellectual property in this way supports our InnoRenew CoE team as they create new knowledge.

Our internationalization efforts were the catalyst for InnoRenew CoE's growth in 2019. We will expand upon them to increase our global impact in 2020.

Predgovor direktorice InnoRenew CoE

V tretjem letu InnoRenew CoE smo uresničenju naše vizije, da postanemo svetovno priznana raziskovalna ustanova, ki vodi preboj v interdisciplinarni znanosti o grajenem okolju, že bliže. Nova partnerstva z industrijo in raziskovalnimi ustanovami še naprej uspešno gradimo tako na nacionalni kot mednarodni ravni. V letošnjem poročilu poudarjamo naše mednarodne dejavnosti in prisotnost.

Internacionalizacija poganja naše poslanstvo, da »nadgradimo najsodobnejše znanstvene in gospodarske izsledke z interdisciplinarnimi raziskavami ter si prizadevamo za znanstveno in inovacijsko odličnost, in to še posebej na dveh osrednjih področjih našega raziskovanja: pri modifikaciji lesa in pri restorativnem okoljskem in ergonomskem oblikovanju (REED)«. Naše delo bo vplivalo na znanstveni, gospodarski in družbeni razvoj zunaj naših meja, če ga bomo delili s svetom.

V letu 2019 se nam je pridružilo 12 novih zaposlencev; skupno jih imamo trenutno 58. Enainpetdeset odstotkov vseh zaposlenih je tujcev, ki prihajajo iz 15 držav – iz Belgije, Bosne in Hercegovine, Brazilije, Češke, Finske, Francije, Hrvaške, Indije, Italije, Madžarske, Norveške, Poljske, Švedske, Tajske in ZDA.

Organizirali smo prvo mednarodno konferenco InnoRenew CoE »Les – zdrava prihodnost za trajnostne zgradbe«, ki se bo, kot verjamem, razvila v prepoznavno in dobro obiskano letno konferenco, ki privablja udeležence s celega sveta. Pripravljanje in izvajanje tega dogodka nam omogoča, da gradimo interdisciplinarno mrežo in začenjamo nova mednarodna sodelovanja, ki se razvijajo na podlagi skupnega strokovnega znanja in izkušenj. Prizadevanja za internacionalizacijo smo dodatno okrepili z ustanovitvijo odprtodostopne recenzirane revije *Interdisciplinary Perspectives on the Built Environment* (Interdisciplinarni vidiki grajenega okolja), v kateri bodo objavljene visokokakovostne raziskave na stičišču trajnostnosti, zdravja in grajenega okolja.

V mednarodnem prostoru smo zelo prisotni – naši raziskovalci in drugo osebje so v zadnjem letu sodelovali na 58 mednarodnih konferencah. Ostajamo dejavni pri številnih mednarodnih združenjih, tako sam inštitut kot tudi posamezni zaposleni.

Ker smo v InnoRenew CoE odprti za povezovanja, gostimo raziskovalce in predstavnike industrije v naših laboratorijih, naši raziskovalci pa imajo možnost, da hodijo na raziskovalne obiske v tujino in s tem nadgrajujejo svoje delo in ustvarjajo nove povezave. Leta 2019 smo sprejeli 155 tujih obiskovalcev iz 30 držav, od katerih jih je 19 prišlo na dolgoročne raziskovalne obiske, medtem ko so naši raziskovalci izvedli osem raziskovalnih obiskov v tujini.

Napredovali smo pri naših prizadevanjih za tesno sodelovanje z nacionalno in mednarodno industrijo. Živemu laboratoriju InnoRenew, naši inovacijski platformi, ki se posveča izzivom, povezanim z gozdno-lesno verigo vrednosti, in pri tem med seboj povezuje strokovnjake z različnih področij, so se pridružili novi člani; trenutno ima 115 članov iz 28 držav. Poleg tega smo skupaj s podjetjem Metadynea prijavili evropski patent, prvega od mnogih, ki še pridejo. V prihodnje si želimo z industrijo ustvariti še več novih znanj, ki jih bomo zaščitili kot skupno intelektualno lastnino.

Napredovali smo tudi pri pridobivanju raziskovalnih sredstev iz Slovenije in Evropske unije. Oddali smo več kot 40 projektnih prijav, ki so InnoRenew CoE prinesle skoraj štiri milijone evrov sredstev. Veliko naših projektnih načrtov je še v ocenjevanju; veselimo se rezultatov, ki bodo še dodatno poudarili uspeh InnoRenew CoE v letu 2019.

Za nas je zelo pomembno, da se glas o InnoRenew CoE širi tudi zunaj znanstvene skupnosti, zato me veseli, da smo bili vključeni v videoposnetek Euronewsa, ki je dosegel širšo javnost na področju Evrope. Da bi postali v Evropi še bolj vidni, smo med drugim na Uradu Evropske unije za intelektualno lastnino (EUIPO) registrirali svoje ime in logotip in za oboje pridobili certifikat blagovne znamke EU. S takšnim načinom zaščite intelektualne lastnine podpiramo ekipo InnoRenew CoE pri ustvarjanju njenega novega znanja.

Naša prizadevanja za internacionalizacijo so spodbujala rast InnoRenew CoE v letu 2019. V letu 2020 jih bomo še okrepili in s tem povečali svoj globalni vpliv.

Dr. Andreja Kutnar

Organizational structure
Organizacijska struktura

The InnoRenew CoE Renewable Materials and Healthy Environments Research and Innovation Centre of Excellence (InnoRenew CoE) was formally established on 15 February 2017 in accordance with the provisions of Article 2 of the Institutes Act of Slovenia (Ur. L. RS 12/91, 8/96, 36/00 and 127 /06) and the Contract of Establishment of the InnoRenew CoE Renewable Materials and Healthy Environments Research and Innovation Centre of Excellence dated 29 November 2016.

The InnoRenew CoE is a not-for-profit private institute (in Slovenian legislation, "neprofitni zasebni zavod").

The InnoRenew CoE organizational structure consists of the Assembly of Founders, Executive Board, Director and Council of Experts. Living Laboratory InnoRenew is included as an integrated organizational unit.

The InnoRenew CoE Director is entitled to enter into contracts and legal transactions on behalf of the institute and act as its representative before the courts and other authorities without restriction.

InnoRenew CoE Center odličnosti za raziskave in inovacije na področju obnovljivih materialov in zdravega bivanjskega okolja (InnoRenew CoE) je bil ustanovljen 15. 2. 2017 na podlagi določil 2. člena Zakona o zavodih (Uradni list RS, št. 12/91, 8/96, 36/00 in 127/06) in pogodbe o ustanovitvi InnoRenew CoE Centra odličnosti za raziskave in inovacije na področju obnovljivih materialov in zdravega bivanjskega okolja, z dne 29. novembra 2016.

InnoRenew CoE je neprofitni zasebni zavod.

Organizacijsko strukturo InnoRenew CoE sestavljajo skupščina ustanoviteljev, svet zavoda, direktor in strokovni svet. Zavod ima tudi integrirano organizacijsko enoto Živi laboratorij InnoRenew.

InnoRenew CoE zastopa direktorica izr. prof. dr. Andreja Kutnar, ki skladno s statutom upravičeno v imenu InnoRenew CoE sklepa pogodbe in druge pravne posle ter zastopa InnoRenew CoE pred sodišči in drugimi organi brez omejitev.

Assembly of Founders

University of Primorska
45.1% of the institute's capital

Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut WKI (Fraunhofer WKI)
24.9% of the institute's capital

Institute for the Protection of Cultural Heritage of Slovenia
15% of the institute's capital

Slovenian National Building and Civil Engineering Institute
15% of the institute's capital

Executive Board

Prof. Dragan Marušič, PhD; University of Primorska
Chair

Prof. Klavdija Kutnar, PhD; University of Primorska
Founder representative

Prof. Bohumil Kasal, PhD; Fraunhofer WKI
Founder representative

Anita Klemen, Msc; Institute for the Protection of Cultural Heritage of Slovenia
Founder representative

Ustanovitelji zavoda

Univerza na Primorskem / Università del Litorale
45,1 % kapitala zavoda

Fraunhofer-Gesellschaft zur Förderung der Angewandten Forschung Eingetragener Verein
24,9 % kapitala zavoda

Javni zavod Republike Slovenije za varstvo kulturne dediščine
15 % kapitala zavoda

Zavod za Gradbeništvo Slovenije
15 % kapitala zavoda

Svet zavoda

Prof. dr. Dragan Marušič; Univerza na Primorskem
Predsednik

Prof. dr. Klavdija Kutnar; Univerza na Primorskem
Predstavnica ustanoviteljev

Prof. dr. Bohumil Kasal; Fraunhofer WKI
Predstavnik ustanoviteljev

Mag. Anita Klemen; Zavod za varstvo kulturne dediščine Slovenije
Predstavnica ustanoviteljev

InnoRenew CoE Council of Experts home countries. Image: InnoRenew CoE
Države, iz katerih so člani strokovnega sveta InnoRenew CoE. Foto: InnoRenew CoE

Assoc. Prof. Andraž Legat, PhD; Slovenian National Building and Civil Engineering Institute
Founder representative

Mateja Mešl, Msc; Pulp and Paper Institute
Partner representative

Matej Gojčič; Regional Development Agency of the Ljubljana Urban Region
Partner representative

Amy Noel Simmons, Msc; InnoRenew CoE
Employee representative

Karolina Schlegel; Republic of Slovenia Ministry of Education, Science and Sport
Public representative

Izr. prof. dr. Andraž Legat; Zavod za gradbeništvo Slovenije
Predstavnik ustanoviteljev

Mag. Mateja Mešl; Inštitut za celulozo in papir
Predstavnica partnerjev

Matej Gojčič; Regionalna razvojna agencija Ljubljanske urbane regije
Predstavnik partnerjev

Mag. Amy Noel Simmons; InnoRenew CoE
Predstavnica zaposlenih

Karolina Schlegel; Ministrstvo za izobraževanje, znanost in šport Republike Slovenije
Predstavnica javnosti

Director

Assoc. Prof. Andreja Kutnar, PhD

Direktorica

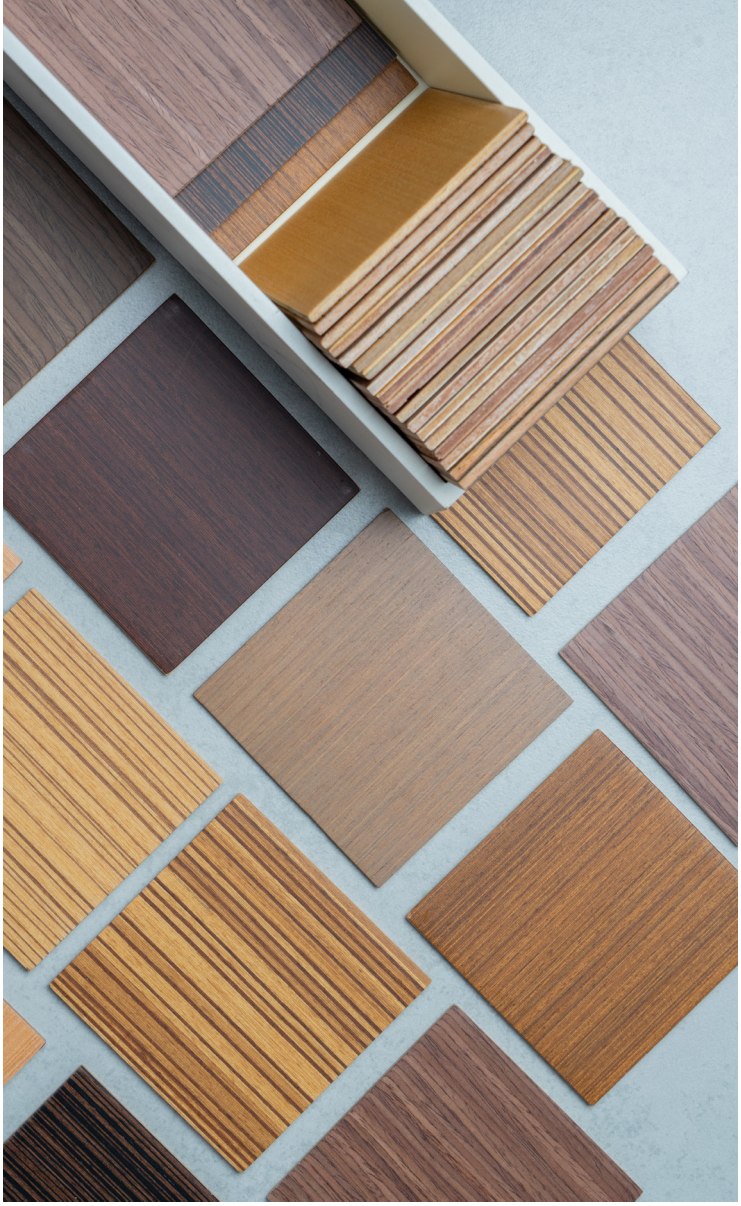
Izr. prof. dr. Andreja Kutnar

Council of Experts

Petr Hajek, PhD; Czech Republic
Duncan Mayes; Finland
Mariapaola Riggio, PhD; USA
Peter Niemz, PhD; Switzerland
Ritva Toivonen, PhD; Finland
Milan Vatovec, PhD; USA

Strokovni svet

Dr. Petr Hajek, Češka
Duncan Mayes, Finska
Dr. Mariapaola Riggio, ZDA
Dr. Peter Niemz, Švica
Dr. Ritva Toivonen, Finska
Dr. Milan Vatovec, ZDA



Vision, mission and values
Vizija, poslanstvo in vrednote

Vision

The InnoRenenw CoE sees solutions to the climate crisis in the science of buildings and materials; however, many challenges remain: addressing sustainability in building construction, operation and use; optimizing renewable materials; understanding human patterns of behavior within the built environment; improving occupant well-being and enhancing social cohesion.

Confronting these challenges through interdisciplinary science will allow us to construct a built environment that is sustainable, healthy and supports society's growing need for advanced building and renovation techniques.

Success in this endeavor will be built upon the InnoRenew CoE foundation of scientific work, creativity, innovation, industry cooperation and societal engagement.

Our vision is to be both a world leader in the interdisciplinary science of the built environment and a model for international research excellence, industrial collaboration and public engagement.

Mission

The InnoRenew CoE's mission is to advance the state of the art and achieve scientific and innovation excellence through interdisciplinary science, especially in our two key research areas: wood modification and restorative environmental and ergonomic design (REED).

Vizija

InnoRenew CoE vidi rešitve za podnebno krizo v znanosti, ki se posveča stavbam in materialom, kljub temu pa številni izzivi ostajajo: upoštevanje vidika trajnostnosti pri gradnji, obratovanju in uporabi stavb; optimiziranje obnovljivih materialov; razumevanje človeških vzorcev vedenja v okviru grajenega okolja; izboljšanje počutja prebivalcev in povečanje družbene kohezije.

Obravnavanje teh izzivov na podlagi interdisciplinarne znanosti nam bo omogočilo ustvariti trajnostno in zdravo grajeno okolje, ki bo upoštevalo tudi naraščajoče potrebe družbe po naprednih tehnikah za obnovo in gradnjo.

Uspeh teh prizadevanj se bo gradil na temelju znanstvenega dela v InnoRenew CoE, kreativnosti, inovativnosti, sodelovanja z industrijo in vključevanja družbe.

Naša vizija je, da na področju interdisciplinarne znanosti, ki obravnava grajeno okolje, postanemo vodilna ustanova na svetu in zgled odličnosti za mednarodno raziskovanje, sodelovanje z gospodarstvom in vključevanje javnosti.

Poslanstvo

Poslanstvo InnoRenew CoE je nadgrajevanje najsodobnejših znanstvenih in gospodarskih izsledkov z interdisciplinarnimi raziskavami ter prizadevanje za znanstveno in inovacijsko odličnost, in to še posebej na dveh osrednjih področjih našega raziskovanja: pri modifikaciji lesa in pri restorativnem okoljskem in ergonomskem oblikovanju (REED).

Values

Inclusion and diversity: We build on our inclusion and diversity to enable personal development, creativity and realization of ideas.

Sustainability: We believe that preservation of nature, environmental stewardship and sustainable development will advance human- and nature-friendly economic and social progress.

Integrity: We have personal integrity and integrity in our actions to ensure respect and dignity within our institute and with our partners, collaborators and communities.

Pursuit of excellence: We pursue excellence in all areas – science, industry and community – to bring innovative solutions that address global issues of renewability and sustainability.

Open science: We are committed to open science and engage in the free global exchange of knowledge through open access and dissemination of our research and results.

Vrednote

Vključenost in raznovrstnost: Gradimo na vključenosti in raznovrstnosti, kar nam omogoča osebnosti razvoj, ustvarjalnost in uresničevanje idej.

Trajnostnost: Verjamemo, da bodo ohranjanje narave, upravljanje z okoljem in trajnostni razvoj spodbudili človeku in naravi prijazen gospodarski in družbeni napredek.

Integriteta: Skrbimo za osebno integriteto in integriteto pri delovanju, da zagotovimo spoštovanje in dostojanstvo na lastnem inštitutu in v odnosu do naših partnerjev, sodelavcev ter skupnosti.

Prizadevanje za odličnost: Na vseh področjih – v znanosti, industriji in skupnosti – si prizadevamo za odličnost, da bi k svetovni problematiki obnovljivosti in trajnostnosti prispevali inovativne rešitve.

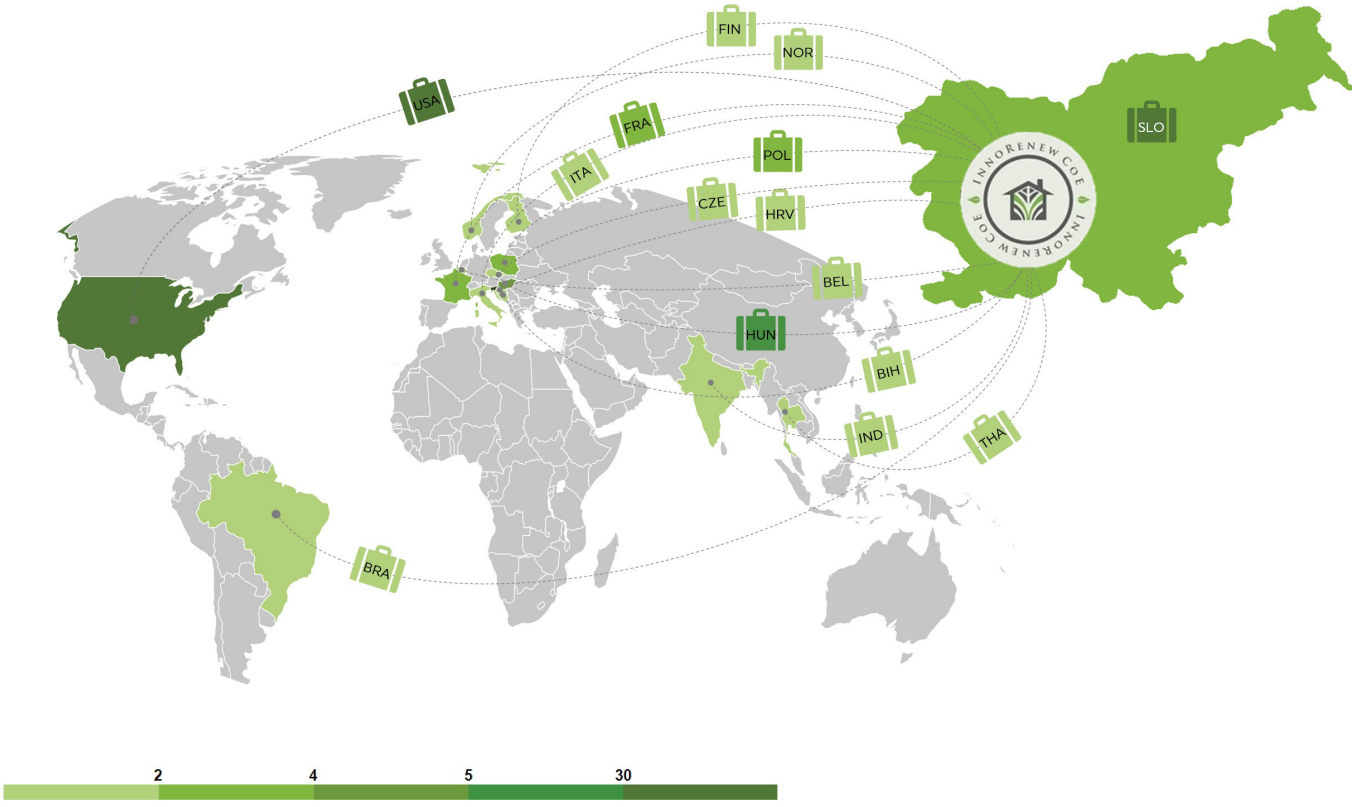
Odprta znanost: Zavezani smo odprti znanosti in vključevanju v brezplačno globalno izmenjavo znanja, k čemur prispevamo z odprtodostopnimi objavami in razširjanjem naših raziskav in rezultatov.

The InnoRenew CoE team

Ekipa InnoRenew CoE

The team of experts at InnoRenew CoE is diverse, not only in areas of expertise but also in cultural and societal backgrounds. Since the very beginning of the InnoRenew CoE, the team has been highly international. **Today we employ almost 60 professionals from around the globe, more precisely, from 15 countries covering almost all continents: Belgium, Bosnia and Herzegovina, Brazil, Croatia, the Czech Republic, Finland, France, Hungary, India, Italy, Norway, Poland, Sweden, Thailand and the USA.**

Ekipa zaposlenih v InnoRenew CoE je zelo raznolika tako glede strokovnih področij, s katerimi se ti ukvarjajo, kot glede kulturnih in družbenih okolij, iz katerih prihajajo. Inštitut je bil mednarodno usmerjen že na samem začetku delovanja. **Danes InnoRenew CoE zaposluje že skoraj 60 strokovnjakov z raznih koncev sveta – iz 15 držav s skoraj vseh celin: Belgije, Bosne in Hercegovine, Brazilije, Češke, Finske, Francije, Hrvaške, Indije, Italije, Madžarske, Norveške, Poljske, Švedske, Tajske in ZDA.**



Home countries of InnoRenew CoE employees. Image: InnoRenew CoE
Države, iz katerih prihajajo zaposleni v InnoRenew CoE. Foto: InnoRenew CoE

The InnoRenew CoE **ensures a welcoming, equitable and diverse working environment** as a main policy. We believe that to be an advanced and internationally renowned research organization requires not only excellent science and innovative thinking but also the capability to address issues such as gender balance within our institutional operations. Among our employees, 48 percent are women.

InnoRenew CoE **zagotavlja prijetno, pravično in raznovrstno delovno okolje**. Prepričani smo, da je za vse napredne ustanove pomembno, da se ukvarjajo tudi z vprašanji, kakršne zastavlja na primer tema spolne (ne)enakopravnosti. Med našimi zaposlenimi je 48 odstotkov žensk.

We bring together 58 different personalities, 58 unique stories that together form the international InnoRenew CoE team.

Each individual employee brings to InnoRenew CoE their own experience and expertise; however, we all share the same goal and motivation to achieve **excellence** in every aspect of our work. Team spirit is strong at the InnoRenew CoE as we are aware that only by working closely together, helping each other, combining knowledge and collaborating can we come to successful results and new, creative solutions in both research and administration. Together we are building a brand for our research institute with every professional action we carry out, every email we send and every presentation we give in Slovenia and around the globe. Moreover, we deliver lectures about our scientific knowledge at different universities and institutes and host researchers and colleagues from other organizations. We publish our findings regularly, and all of our publications are **open access** because we are strongly committed to engaging in the free global exchange of knowledge. We collaborate with industry and strive to become the research institute that industry will rely on when facing new challenges.

For further enhancing team spirit and developing strong connections between us, we organize team-building activities that give us a chance to get to know each other better, socialize outside of the office, network and build stronger relationships. This results in more effective collaboration at work – whether it is in writing project proposals, organizing meetings or conceiving new business ideas. These activities bring people together; we see our co-workers in a different light, and we are able to connect in new, friendly ways. By meeting for informal occasions, a friendly atmosphere develops that has a huge positive impact on productivity, communication between employees, problem-solving and conflict resolution.

We also take care of our younger colleagues' professional development. There are **11 PhD students** at the InnoRenew CoE, and they are supported by the institute in their early academic and research careers.

"Doing my PhD and, at the same time, having a chance to collaborate and discuss my ideas and thoughts with experienced researchers from around the world is a big privilege for me," said Dean Lipovac, who is now in the second year of his PhD studies at the University of Primorska.

In the last two years, two of our employees successfully defended their PhDs. This year, we have five new employees who enrolled in PhD study programs.

"For me, enrolling in the PhD study program is a chance to make important discoveries and achieve something significant within educational science," said Vesna Starman, who enrolled this year to the doctoral study program at the University of Primorska's Faculty of Education.

Inštitut torej povezuje 58 različnih osebnosti, 58 edinstvenih zgodb, in skupaj sestavljamo mednarodno ekipo InnoRenew CoE.

Vsak posameznik prinaša v InnoRenew CoE svoje izkušnje in znanje, vsi skupaj pa delimo isti cilj in motiv – da dosežemo **odličnost** na vsakem področju našega dela. Timski duh nam je zelo pomemben, saj se zavedamo, da samo s skupnim delom, medsebojno pomočjo, združevanjem znanja in sodelovanjem lahko pridemo do odličnih rezultatov in do novih, kreativnih rešitev tako pri raziskovanju kot pri administrativnem delu. Z vsako aktivnostjo, poslano elektronsko pošto in predstavitvijo doma ali drugod po svetu skupaj gradimo znamko našega raziskovalnega instituta. Poleg tega tudi predavamo in strokovno znanje predajamo slušateljem na različnih univerzah in inštitutih ter gostimo raziskovalce in kolege iz drugih organizacij. Redno objavljamo svoje ugotovitve in rezultate, pri čemer so naše objave **odprtodostopne**, saj smo privrženci ideje o brezplačni globalni izmenjavi znanja. Tesno sodelujemo z industrijo in si prizadevamo postati raziskovalni inštitut, na katerega se bodo industrijski partnerji obrnili s svojimi izzivi in se nanj zanesli.

Za dodatno spodbujanje in razvoj timskega duha večkrat organiziramo »teambuilding« dejavnosti, pri katerih se družimo tudi zunaj pisarne in bolje spoznavamo, in tako gradimo močne medsebojne vezi in odnose. To se odraža tudi v učinkovitejšem sodelovanju pri delu – bodisi pri pisanju in pripravi projektnih prijav, organiziranju sestankov ali pri snovanju novih poslovnih idej. Take dejavnosti ljudi zbližujejo, sodelavce vidimo v drugačni luči in povežemo se na drugačen, nov, prijateljski način. Na neformalnih srečanjih se razvije prijateljsko vzdušje, ki pozitivno vpliva na delo in komunikacijo med zaposlenimi, pa tudi na reševanje problemov.

Posebno skrb posvečamo tudi mlajšim kolegom in njihovemu poklicnemu razvoju. Med zaposlenimi je **11 doktorskih študentov**, ki jih spodbujamo in spremljamo od samega začetka njihovih raziskovalnih poti.

»Da delam doktorat in imam obenem priložnost sodelovati in razpravljati o svojih idejah in misih s tako izkušenimi raziskovalci s celega sveta, je zame velik privilegij,« je dejal Dean Lipovac, ki je trenutno v drugem letniku doktorskega študija na Univerzi na Primorskem.

V zadnjih dveh letih sta dva naša zaposlena uspešno končala doktorski študij, v letu 2019 pa se je pet zaposlenih vpisalo na doktorske programe.

»Zame je vpis na doktorski študij priložnost, da se prebijem do odkritij in dosežem nekaj pomembnega v pedagoški znanosti,« je rekla Vesna Starman, ki se je letos vpisala na doktorski študijski program Pedagoške fakultete Univerze na Primorskem.

Personal and professional development is important for every team member at the InnoRenew CoE. This is why we encourage attending workshops, trainings and internship programs. In 2019, employees attended 73 national and international conferences, 58 national and international trainings and meetings and carried out 8 long-term research visits or trainings at international organizations and institutes.

"At the beginning of June 2019, I attended a two-week workshop, 'Advanced Optimization for Chemical and Biochemical Processes', at the Technical University of Denmark," noted Dr Balázs Dávid, researcher in InnoRenew CoE's ICT group. "While optimization problems are not new to me, I haven't really encountered ones before that have a root in chemistry or biochemistry. The workshop gave me an insight into this world, and the experience it provided will be useful in future InnoRenew CoE projects."

On the other hand, we also welcome others to our institute for trainings. **In 2019, we hosted 155 international visitors, including 19 researchers who stayed with us for a longer period to jointly utilize our labs.**

The **gender aspect** is of great importance for the InnoRenew CoE; therefore, we organized a training on gender-related issues in research and innovation that was attended by all of our employees.

"Gender disparity is still a big problem in the research and academic sphere, especially in science, technology, engineering and mathematics (STEM) disciplines," said Amy Simmons, InnoRenew CoE assistant researcher currently working on this topic. "Despite approximately equal numbers of women and men in STEM earning bachelor's degrees, the gap between women and men in research positions widens each step up the ladder. Women hold only 15 percent of upper-level academic positions. This lack of diversity has an overall negative impact on research and innovation. At the InnoRenew CoE, we are well aware of this challenge and this is why in all our research projects we strive for gender balance."

The 2019 gender balance workshop helped our employees to understand this issue and successfully incorporate the gender dimension into our research projects to produce excellent results.

Such a diverse and international team of experts as the one we have at the InnoRenew CoE together writes a successful story of our research institute's great development with a common wish for this collaboration to continue.

V InnoRenew CoE skrbimo za osebni in poklicni razvoj vsakega zaposlenega. Spodbujamo udeležbo na delavnicah, izobraževanjih in pripravniških programih. V letu 2019 smo se udeležili 73 nacionalnih in mednarodnih konferenc, 58 nacionalnih in mednarodnih izobraževanj in sestankov ter omogočili osem daljših raziskovalnih obiskov ali usposabljan v mednarodnih organizacijah in na inštitutih.

»V začetku junija 2019 sem se udeležil dvotedenske delavnice z naslovom Advanced Optimization for Chemical and Biochemical Processes, ki je potekala na Tehniški univerzi na Danskem,« je povedal raziskovalec raziskovalne skupine za informacijsko in računalniško tehnologijo v InnoRenew CoE dr. Balázs Dávid. »Optimizacijski problemi niso nič novega zame, a nikoli prej se še nisem srečal s takimi, ki izvirajo iz kemije ali biokemije. Ta delavnica me je vpeljala v ta svet in znanje, ki sem ga pridobil, je pomembno za moje delo pri projektih v InnoRenew CoE.«

Po drugi strani pa tudi z veseljem sprejmemo tuje goste, ki pridejo na izobraževanje in usposabljanje na naš inštitut. **V letu 2019 smo gostili 155 gostov iz tujine, med temi je bilo kar 19 takih, ki so z nami ostali dlje časa.**

Zagotavljanje **enakopravnosti spolov** je zelo pomembno za InnoRenew CoE, zato smo organizirali delavnico za vse zaposlene, kjer smo razpravljali o vprašanjih, povezanih predvsem z neenakopravnostjo med spoloma na področju raziskav in inovacij.

»Spolna neenakopravnost je na raziskovalnem in akademskem področju še vedno velik problem, predvsem v znanosti, tehnologiji, gradbeništvu in matematiki,« je rekla Amy Simmons, raziskovalna asistentka v InnoRenew CoE, ki se trenutno ukvarja s to temo. »Število moških in žensk, ki so zaključili študij omenjenih disciplin, je skoraj enako, a z vzpenjanjem po lestvici raziskovalnih pozicij razlika med moškimi in ženskami strmo narašča. Ženske zasedajo samo še 15 odstotkov višjih akademskih položajev. To pomanjkanje raznolikosti ima negativen učinek tudi na raziskave in inovacije. V InnoRenew CoE se tega zelo dobro zavedamo in prav zato v vseh naših raziskovalnih projektih spolno ravnotežje obravnavamo in si zanj prizadevamo.«

Na delavnici so naši zaposleni odkrili nove plati te problematike, prišli pa so tudi do ugotovitev, kako ta vidik vključiti v raziskovalne projekte, da bi bili ti še uspešnejši in bi prinesli odlične rezultate.

V InnoRenew CoE torej tako raznolika mednarodna ekipa strokovnjakov, ki jih tesno povezuje želja, da bi se sodelovanje nadaljevalo, skupaj piše uspešno zgodbo razvoja našega raziskovalnega inštituta.

Gender balance workshop. Image: InnoRenew CoE
Delavnica o zastopanosti spolov v znanosti. Foto: InnoRenew CoE

Scientific research at InnoRenew CoE

Znanstveno raziskovanje na InnoRenew CoE

Home countries of InnoRenew CoE researchers. Image: InnoRenew CoE
Države, iz katerih prihajajo raziskovalci v InnoRenew CoE. Foto: InnoRenew CoE

Work at the InnoRenew CoE is based on **interdisciplinarity** and **integration** in a scientific, economic and international context. Research at the institute is, therefore, very diverse and branched out, both in terms of fields and topics as well as project partners (public institutions, independent research institutes, companies, municipalities, associations) in Slovenia and worldwide.

The institute currently employs **40 researchers and research assistants**, of which 33 are part of research groups. The seven researchers and research assistants that work outside the groups cover a variety of fields, from analytical chemistry and biotechnological wood modification processes through statistics and school education to innovation management, international collaboration and science communication.

Each group also covers its own range of fields; at the same time, they are intertwined and interconnected. For some projects, several researchers from different fields are involved. The work of researchers is motley also in view of international integration, as they participate in projects that are bilateral as well as those that bring together researchers from all over Europe and other countries, like the COST Actions. **Out of a total of 23 projects performed by InnoRenew CoE in 2019, six were international – three under Horizon 2020, one Erasmus+ and two ERA-NET**

Delovanje inštituta InnoRenew CoE temelji na **interdisciplinarnosti** in **povezovanju** v znanstvenem, gospodarskem in mednarodnem okviru. Raziskave na inštitutu so zato zelo raznolike in razvejane tako glede na področja in tematike kot projektne partnerje (javne ustanove, neodvisni raziskovalni inštituti, podjetja, občine, združenja ...) v Sloveniji in po svetu.

Inštitut trenutno zaposluje **40 raziskovalcev in raziskovalnih asistentov**, od teh jih je 33 vključenih v raziskovalne skupine, sedem pa jih deluje zunaj njih. Ti raziskovalci in raziskovalni asistenti ob podpori tehničnih sodelavcev pokrivajo različna področja, od analitične kemije in biotehnoloških postopkov modifikacije lesa prek statistike in šolskega izobraževanja do menedžmenta inovacij, mednarodnega sodelovanja in komuniciranja znanosti.

Tudi vsaka izmed skupin pokriva svoj krog področij, obenem pa se med seboj stikajo in prepletajo, zato pri nekaterih projektih hkrati sodeluje več raziskovalcev z različnih področij. Delovanje raziskovalcev pa je pestro tudi z vidika mednarodnih povezovanj, saj sodelujejo pri projektih, ki so tako bilateralni kot taki, ki med seboj povežejo raziskovalce iz vse Evrope in

ForestValue – and 10 were bilateral (in cooperation with Austria, USA, Italy, Bosnia and Herzegovina and Serbia). The research groups were set up by the establishment of InnoRenew CoE in 2017 and upgraded over time by new projects and strengthened teams, such as visiting researchers that often join as permanent members.

The **Human Health in the Built Environment group** works in the fields of wood science, biopsychology, psychogeriatrics, psychology, kinesiology, green building certification, neurophysiology and data analytics. It is currently involved in six projects, four of which are international. In 2019, special attention was paid to better furniture design for musculoskeletal health in school children, office furniture that supports active work and musculoskeletal health as well as healthy environments for older adults to support their independence, health and overall well-being at home and work.

Dr. Michael Burnard. Image: InnoRenew CoE
Dr. Michael Burnard. Foto: InnoRenew CoE

tudi drugih držav, kakršne so na primer akcije COST. **Od skupno 23 projektov, ki jih je v letu 2019 izvajal InnoRenew CoE, je bilo šest mednarodnih, od tega trije v okviru programa Obzorje 2020, en Erasmus+ in dva ERA-NET ForestValue, 10 pa je bilo bilateralnih (v sodelovanju z Avstrijo, ZDA, Italijo, Bosno in Hercegovino ter Srbijo).**

Ob ustanovitvi inštituta InnoRenew CoE leta 2017 je bilo zasnovanih pet raziskovalnih skupin, ki so se nadgrajevale tako s pridobivanjem novih projektov kot z okrepljenimi ekipami, pri čemer se stalnim članom pogosto pridružijo še gostujoči raziskovalci.

Skupina **Človekovo zdravje v grajenem okolju** deluje na področjih znanosti o lesu, biopsihologije, psihogeriatrije, psihologije, kineziologije, certificiranja zelenih gradenj, nevrofiziologije in analize podatkov. Trenutno sodeluje pri šest projektih, od katerih so štirje mednarodni. Leta 2019 so se še posebej posvetili oblikovanju šolskega pohištva, ki podpira zdravje mišično-skeletnega sistema, pisarniškemu pohištvu, ki spodbuja aktivno delo in zdravje mišično-skeletnega sistema, in zdravemu okolju za starejše odrasle, ki omogoča njihovo neodvisnost ter zdravje in dobro počutje tako doma kot na delovnem mestu.

"The main challenge our group is trying to address is central to just about every sector – creating healthy working, learning and living environments using sustainable building materials and methods." – Dr. Burnard, leader of the Human Health in the Built Environment group

»Naša skupina se sooča z izzivi, ki so osrednjega pomena za domala vsak sektor: ustvariti zdravo delovno, učno in bivalno okolje in pri tem uporabiti obnovljive materiale.« – Dr. Michael Burnard, vodja skupine Človekovo zdravje v grajenem okolju

The **Wood Modification group** works in the fields of wood science and technology, chemistry, physics, material science and lifelong learning. It is currently involved in ten projects, eight of which are international. In 2019, the team addressed a number of challenges. Among other things, they were working on implementation of spectroscopy for quality control during production in trials with Swiss industry. In order to improve the quality

Skupina **Modifikacija lesa** deluje na področjih znanosti o lesu in tehnologije lesa, kemije, fizike, znanosti o materialih in vseživljenjskega učenja. Trenutno sodeluje pri desetih projektih, od teh je osem mednarodnih. V letu 2019 se je ekipa posvetila številnim izzivom. Med drugim so v sodelovanju s švicarskimi industrijskimi partnerji preizkušali uporabo spektroskopije pri nadzoru kakovosti med

and performance of Xylo biofinish coating, they made evaluation of Aureobasidium pullans growth on wooden surfaces. They were also working on new chemometric models for determination of lignin origin and properties by means of NIR spectroscopy and chemometrics.

proizvodnjo. Da bi izboljšali kakovost in učinkovitost vrhnje prevleke lesa, pripravljene z biotehnološkim postopkom, so ovrednotili rast kvasovke *Aureobasidium pullans* na lesenih površinah. Ukvarjali so se tudi z novimi kemometričnimi modeli, ki na podlagi NIR-spektroskopije in kemometrije določajo izvor in lastnosti lignina.

"In 2019, the acquisition of four new members was very important to the group so as that we have learned to work as a group. The acquiring of silver members for Living Lab InnoRenew was important as well." – Dr. Sandak, leader of the Wood Modification group

»V letu 2019 so bili za skupino zelo pomembni pridobitev štirih novih članov in to, da smo se naučili delovati kot tim, pa tudi pridobitev srebrnih članov Živega laboratorija InnoRenew.« – Dr. Anna Sandak, vodja skupine Modifikacija lesa

Dr. Anna Sandak. Image: InnoRenew CoE
Dr. Anna Sandak. Foto: InnoRenew CoE

The **Sustainable Building with Renewable Materials group** works in the fields of architectural and engineering design and consulting on larger timber buildings, diverse life cycle assessment (LCA) analyses, complex acoustic engineering and cultural heritage. It is currently involved in four projects, two of which are international. Among their biggest challenges in 2019 was to establish new and strengthen existing connections with the Austrian and German timber construction industry as well as binding their expertise with other research groups, offering services to other research institutions, domestic and foreign.

Skupina **Trajnostna gradnja z obnovljivimi materiali** deluje na področjih arhitekturnega ter inženirskega projektiranja in svetovanja pri večjih lesenih stavbah, analize življenjskega cikla (LCA), akustičnega projektiranja in kulturne dediščine. Trenutno sodeluje pri štirih projektih, od teh sta dva mednarodna. Med njihovimi največjimi izzivi v letu 2019 je bila vzpostavitev novih in krepitev obstoječih sodelovanj z avstrijsko in nemško panogo lesene gradnje ter povezave z drugimi raziskovalnimi skupinami na inštitutu, da bi lahko ponudili storitve, ki jih druge domače in tuje raziskovalne ustanove nimajo.

Dr. Iztok Šušteršič. Image: InnoRenew CoE
Dr. Iztok Šušteršič. Foto: InnoRenew CoE

"The goal of the group is to become one of the most relevant R&D support entities to the tall timber building industry." – Dr. Šušteršič, leader of the Sustainable Building with Renewable Materials group

»Cilj skupine je, da postane eden najpomembnejših raziskovalno-razvojnih podpornih subjektov v industriji gradnje visokih lesenih stavb.« – Dr. Iztok Šušteršič, vodja skupine Trajnostna gradnja z obnovljivimi materiali

The main fields that the **ICT in Renewable Materials and Sustainable Building group** is working in are information and communication technologies, information engineering and applied mathematics. It is currently involved in ten projects, four of which are international. The group was trying to address many challenges in 2019. The most important among them were developing robust large-scale supply chain networks in reverse logistics for the wood industry, developing efficient new models and analytical methods for hyperspectral imaging, developing a multi-objective decision support system for heterogonous structures in building design, integrated optimization solutions in sensor network design and decentralized blockchain-based edge computing solutions for IoT.

Dr. Miklós Krész. Image: InnoRenew CoE
Dr. Miklós Krész. Foto: InnoRenew CoE

The **Renewable Materials Composites group** works in the fields of bio-based composites, wood mechanics, non-destructive evaluation, material characterization and adhesion of materials. It is currently involved in many projects, five of which are international. The year 2019 has given the group a particularly big challenge – and an opportunity – in industry: developing value-added renewable composite materials from underutilized wood species within Slovenia and throughout Europe.

"Research, development and innovation (RDI) in renewable composite materials has the potential to foster increased utilization throughout the entire wood value chain (logs through cellulose) within Slovenia and the EU." – Dr. DeVallance, leader of the Renewable Materials Composites group

»Z raziskavami, razvojem in inovacijami (RDI) na področju obnovljivih kompozitnih materialov bi lahko povečali uporabo lesa v celotni vrednostni verigi (od hlodov do celuloze) tako v Sloveniji kot drugod v Evropski uniji.« – Dr. David B. DeVallance, vodja skupine Kompoziti iz obnovljivih materialov

Glavna področja, na katerih deluje skupina **Informacijske in računalniške tehnologije na področju obnovljivih materialov in trajnostne gradnje**, so informacijske in komunikacijske tehnologije, informacijski inženiring in uporabna matematika. Skupina trenutno sodeluje pri desetih projektih, od teh so štirje mednarodni. Med izzivi, s katerimi se je skupina začela ukvarjati leta 2019, so posebej pomembni razvoj stabilnega obsežnega omrežja oskrbovalne verige v povratni logistiki lesne industrije, razvoj učinkovitih novih modelov in analitičnih metod za hiperspektralno slikanje, razvoj večobjektivnega odločevalnega podpornega sistema za heterogene strukture pri projektiranju konstrukcij, vključevanje optimizacijskih rešitev v zasnovo senzorskih mrež in rešitve računalništva na robu (edge computing) za internet stvari (IoT), zasnovane na podlagi decentraliziranega veriženja blokov (blockchain).

"Our special focus is system architecture design, industrial optimization, scientific computing and knowledge discovery." – Dr. Krész, leader of the ICT in Renewable Materials and Sustainable Building group

»Še posebej se posvečamo sistemski arhitekturi, industrijski optimizaciji in odkrivanju znanja na področju računalništva.« – Dr. Miklós Krész, vodja skupine Informacijske in računalniške tehnologije na področju obnovljivih materialov in trajnostne gradnje

Skupina **Kompoziti iz obnovljivih materialov** deluje na področjih kompozitov, narejenih na osnovi biotskih materialov, mehanike lesa, neporušnega vrednotenja, karakterizacije materialov in njihove adhezivnosti. Trenutno sodeluje pri številnih projektih, posebej pomembnih jih je šest, od teh je pet mednarodnih. Leto 2019 je skupini prineslo še posebej velik izziv – in obenem priložnost – v industriji: razvoj obnovljivih kompozitnih materialov z dodano vrednostjo, narejenih iz premalo izkoriščenih vrst lesa iz Slovenije oziroma Evrope.

Dr. David B. DeVallance. Image: InnoRenew CoE
Dr. David B. DeVallance. Foto: InnoRenew CoE

Selection of research achievements in 2019

Izbor raziskovalnih dosežkov v letu 2019

After two years of activity, research at the institute has already made **several tangible achievements**. Among them is an **application for the European patent for production of dimensionally compacted densified wood**, which is the result of development in cooperation with Austrian industrial partner Metadynea, that is certainly important. Researchers also developed and deployed a **sensor prototype solution for Building Information Modelling (BIM)** in a test house (Mrakova domačija – Mrak's homestead).

Significant **new methodologies** have emerged from the research, including the development of a new method for optimization of the design of heterogeneous systems built from modular elements, a new analysis methodology based on smart data in transportation networks and an interactive deconvolution method for IR spectra so as a new approach for determination of the limit state for façade materials. Further, researchers have managed to study new research directions that were foreseen in RDI: molecular dynamics and biomimicry and bioinspiration for wood modification. They have also begun to develop carbonized biomass for use in electrical and composite-related applications.

InnoRenew CoE research experts have also made a **significant contribution to the updated version of European building design standards**. In 2019, under the European Committee for Standardization, they began to work on the development of a new chapter of the Eurocode 8 standard that addresses earthquake analysis of timber buildings.

In addition to **original and review scientific articles** and **professional papers**, InnoRenew CoE researchers are also **co-authors of a scientific monograph published by the renowned Springer publishing house** (Sandak, A., Sandak, J., Brzezicki, M., and Kutnar, A. Bio-based Building Skin. Springer, 2019).

Raziskave na inštitutu so po dveh letih njegovega delovanja že prinesle **več oprijemljivih dosežkov**. Med njimi je gotovo pomembna **prijava evropskega patenta za proizvodnjo dimenzijsko stabilnega zgoščenega lesa**, ki so ga raziskovalci razvili v sodelovanju z avstrijskim industrijskim partnerjem Metadynea. Poleg tega so izdelali tudi **prototip senzorja za informacijsko modeliranje gradenj (BIM)**, ki so ga namestili v testno hišo (Mrakova domačija).

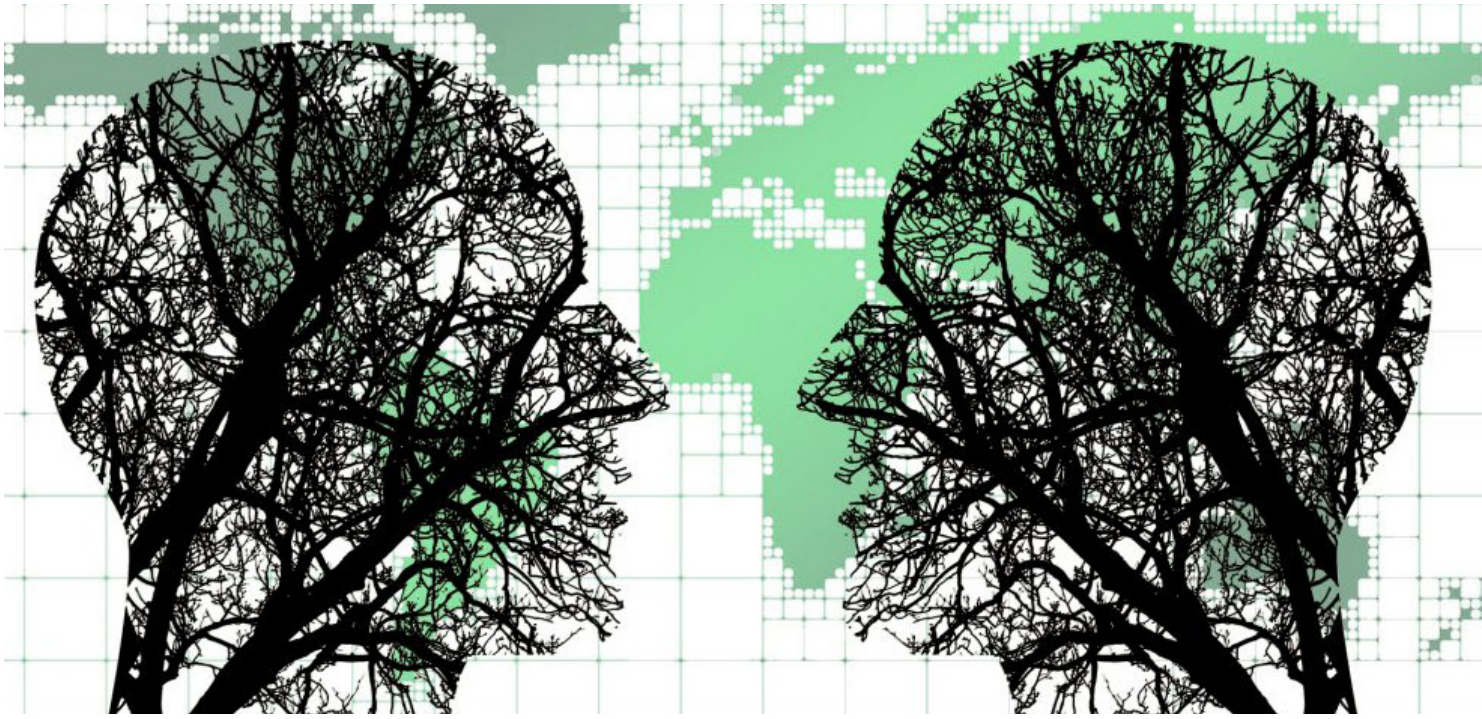
Pri raziskavah so prišli do pomembnih **novih metodologij** – med drugim so razvili novo metodo za optimizacijo načrtovanja heterogenih sistemov, zgrajenih iz modularnih elementov, novo analitsko metodo, ki temelji na pametnih podatkih v prometnih omrežjih, in interaktivno metodo dekonvolucije za spektre IR ter nov pristop pri določanju omejitev pri uporabi fasadnih materialov. Uspelo jim je proučiti molekularno dinamiko ter biomimikrijo in bioinspiracijo pri modifikaciji lesa – novo smer raziskovanja, predvideno v načrtu za raziskave, razvoj in inovacije. Začeli so tudi z razvijanjem karbonizirane biomase, namenjene za uporabo v elektronskih in kompozitnih sistemih.

Strokovnjaki InnoRenew CoE poleg tega **pomembno prispevajo k posodobljeni različici evropskih standardov za projektiranje konstrukcij**. Pod okriljem evropskega komiteja za standardizacijo so leta 2019 začeli delati na razvoju novega poglavja standarda Evrokod 8, ki obravnava potresno analizo lesenih konstrukcij.

Raziskovalci InnoRenew CoE so poleg **izvirnih in preglednih znanstvenih člankov** ter **strokovnih člankov objavili tudi znanstveno monografijo, ki je izšla pri ugledni založbi Springer** (Sandak, A., Sandak, J., Brzezicki, M., in Kutnar, A. *Bio-based Building Skin* – [Stavbni ovoji iz materialov biotskega izvora], Springer, 2019).

Living Lab InnoRenew lives ... because of the people!

Kaj je živega v Živem laboratoriju InnoRenew? Ljudje!



The living lab lives, because of the people! Image: Pixabay
Kaj je živega v Živem laboratoriju InnoRenew? Ljudje! Foto: Pixabay

Living Lab InnoRenew is an **innovation platform** that facilitates development of concepts and policies to address challenges facing the wood-based value chain and its role in a circular economy. Depending on status (gold, silver or associate), Living Lab InnoRenew offers services specific to member needs, including workshops, focus groups and trainings. Member pursuits are at the heart of our collaborative effort to co-create new ideas and solutions.

We bring together **experts from different fields** who contribute to sustainable development of our built environment. Our joint actions are based on trust and cooperation. These key values guide us in the process of design and validation for new ideas and solutions. Our process is based on a common understanding that renewable materials are important for a human- and nature-friendly sustainable future. Our members understand that open innovation is key to their success. Living Lab InnoRenew offers real and virtual space that allows members to work as cooperators rather than competitors, sharing knowledge, information, experience and resources.

Living Lab InnoRenew is actively involved within the InnoRenew CoE and works with its researchers to involve end users in the research process itself, starting at the ideation phase and continuing through concept design, testing and implementation.

Živi laboratorij InnoRenew je **inovacijska platforma**, ki spodbuja razvoj konceptov in politik, namenjenih obravnavanju izzivov, ki so povezani z gozdno-lesno verigo in njeno vlogo v krožnem gospodarstvu. Svojim članom glede na njihov status (zlato, srebrno ali pridruženo članstvo) ponuja različne njim prilagojene aktivnosti in storitve, kot so delavnice, fokusne skupine in izobraževanja. Potrebe članov so v središču skupnih prizadevanj za soustvarjanje novih idej in rešitev.

Živi laboratorij **povezuje strokovnjake z različnih področij**, ki prispevajo k trajnostnemu razvoju grajenega okolja, naše skupno delovanje pa temelji na zaupanju in sodelovanju. To sta ključni vrednoti, ki nas vodita v procesu odkrivanja in oblikovanja novih idej in rešitev. Pri tem izhajamo iz prepričanja, da je za človeku in naravi prijazno trajnostno prihodnost pomembna uporaba obnovljivih materialov. Naši člani razumejo, da je odprto inoviranje ključno za njihov uspeh. Živi laboratorij InnoRenew ponuja dejanski in virtualni prostor, ki članom omogoča, da so tudi s svojimi tekmeci lahko sodelavci, s katerimi delijo znanja, informacije, izkušnje in zmogljivosti.

Živi laboratorij je dejaven tudi znotraj InnoRenew CoE in skupaj z raziskovalci išče načine, kako končne uporabnike vključiti v sam proces raziskovanja, ki se začne pri idejni zasnovi, nadaljuje pa z oblikovanjem konceptov, testiranjem in implementacijo.

Our vision is to become an internationally recognized innovation platform for the co-creation of sustainable solutions based on the use of renewable resources in the built environment. A few highlights from Living Lab InnoRenew's work in 2019 are outlined below.

Membership

In 2019, Living Lab InnoRenew counted **115 members**, half of them companies, from **28 countries**, including 67 Slovenian members. Members include universities, research institutes, municipalities, regional development agencies, ministries, industrial and research associations, technology platforms and clusters, international organizations and interested individuals.

Cooperation

For the **Municipality of Izola (Living Lab InnoRenew gold member)**, a solution for Livade Elementary School courtyard with outdoor classroom and playground with learning path was designed. Living Lab InnoRenew involved the pupils in the process and provided them with an opportunity to co-create one of the playground elements, models of which were displayed at a school exhibition. In preparation of the project, InnoRenew CoE experts from architecture, engineering, wood science, social pedagogy and technology of materials collaborated to produce an interdisciplinary and innovative solution. The thematic learning path that was conceived promotes children's physical and mental development through play.

Made from wooden elements, the learning path will connect separate parts of the school courtyard. Students will be able to use it completely as a single polygon or partially as a content and design complement to each part of the courtyard. The learning path's wooden components, building materials and use of certain elements will be monitored by InnoRenew CoE researchers in order to mentor students on the research tasks in different areas of sustainable development that they will implement. Proposed solutions will have a positive impact on the children's development and the path's flexible construction will allow the project to become an exemplary example for arrangement of outdoor school spaces, which are often contentless and in need of complete renovation.

Naša vizija je, da postanemo mednarodno prepoznana inovacijska platforma za sooblikovanje trajnostno naravnanih rešitev za grajeno okolje, ki temeljijo na uporabi obnovljivih virov. Izbor dosežkov, povezanih z dejavnostjo Živega laboratorija InnoRenew v letu 2019, je naveden v nadaljevanju.

Članstvo

V letu 2019 je imel Živi laboratorij InnoRenew skupno **115 članov** – polovica od teh so podjetja – iz **28 držav**; slovenskih članov je 67. Med člani so poleg podjetij tudi univerze in raziskovalni inštituti, občine, regionalne razvojne agencije, ministrstva, industrijska in raziskovalna združenja, tehnološke platforme in grozdi, mednarodne organizacije in zainteresirani posamezniki.

Sodelovanja

Za **Občino Izola (zlati član Živega laboratorija InnoRenew)** je živi laboratorij sooblikoval rešitev za dvorišče OŠ Livade Izola z zunanjo učilnico in igriščem s tematsko potjo. Pri pripravi projektne rešitve so sodelovali strokovnjaki iz InnoRenew CoE z različnih področjih – od arhitekture, gradbeništva, strojništva, lesarstva in socialne pedagogike do tehnologije materialov. Plod interdisciplinarnega sodelovanja je bila inovativna rešitev nove tematske poti za šolsko dvorišče, ki skozi igro spodbuja tako fizični kot mentalni razvoj otroka. V proces oblikovanja enega sklopa igral smo vključili tudi učence, ki so soustvarjali ideje in jih v obliki maket razstavili na šolski razstavi.

Tematska pot, ki bo povezala ločene dele šolskega dvorišča, bo sestavljena pretežno iz lesenih elementov, učenci pa jo bodo lahko uporabljali v celoti, kot enoten poligon, ali le delno, kot vsebinsko in oblikovno dopolnitev posameznega dela dvorišča. Raziskovalci iz InnoRenew CoE bodo izvajali tudi monitoring različnih lesenih in drugih gradbenih materialov ter spremljali način uporabe določenih elementov in mentorirali raziskovalne naloge z različnih področij trajnostnega razvoja okolja in prostora, ki jih bodo učenci izvajali. Predlagane rešitve pozitivno vplivajo na razvoj otrok in omogočajo postavitve na različnih lokacijah in šolskih dvoriščih. Projekt zato predstavlja vzorčni primer ureditve šolskih prostorov na prostem, ki so pogosto brez vsebin in potrebujejo celovito prenovo.

Občina · Comune di
IZOLA · ISOLA

Learning path and covered outdoor classroom at Livade Elementary School. Image: Aarne Niemelä
Prikaz dela tematske poti in pokrit prostor učilnice OŠ Livade. Foto: *Aarne Niemelä*

InnoRenew CoE helped Polish company **Feniks (Living Lab InnoRenew silver member)** transform their production processes when a fire destroyed their factory by advising them on how to set up production, digitalize processes and implement various information systems.

For **MardomPro (Living Lab InnoRenew silver member)**, an analysis of their waste production and solutions for optimizing production while reducing and reusing waste (e.g., by converting waste into textile fibers) was provided.

Poljskemu podjetju **Feniks (srebrni član Živega laboratorija InnoRenew)** je živi laboratorij pomagal preoblikovati njihove proizvodne procese, ko jim je požar uničil tovarno. Svetoval je pri sami postavitvi proizvodnje, digitalizaciji procesov in implementaciji različnih informacijskih sistemov.

Podjetju **MardomPro (srebrni član Živega laboratorija InnoRenew)** je živi laboratorij pripravil analizo njihovega proizvodnega odpada in podal rešitve za optimizacijo proizvodnje, zmanjšanje odpada in njegovo ponovno uporabo (npr. s pretvorbo odpada v tekstilna vlakna).

Feniks, Living Lab InnoRenew silver member.
Feniks je srebrni član Živega laboratorija InnoRenew.

MardomPro, Living Lab InnoRenew silver member.
MardomPro je srebrni član Živega laboratorija InnoRenew.

Future Challenges series

In 2019, the Living Lab InnoRenew Future Challenges series of events was launched, the purpose of which is to connect various stakeholders within the InnoRenew CoE innovation ecosystem and provide them with an opportunity to collaborate and co-create sustainable process, production and business solutions. The first event, "How to make Slovenia sustainable with renewable materials", brought together more than 40 participants who identified and co-defined six challenges that should be addressed on Slovenia's path to sustainable development with the use of renewable materials:

1. Adding value to wood through experience, new knowledge and innovative technologies

2. Changing behavior for circular sustainability

3. Co-creating smart solutions for a sustainable society by reforestation

4. Integration, coordination and trust among stakeholders

5. Joining experience, knowledge and technology for a functional and sustainable life

6. International integration

Cikel Izzivi prihodnosti

Leta 2019 je Živi laboratorij InnoRenew zasnoval cikel dogodkov Izzivi prihodnosti. Namen dogodkov je povezati različne deležnike inovacijskega ekosistema InnoRenew CoE in jim omogočiti sodelovanje in sooblikovanje trajnostnih procesnih, proizvodnih in poslovnih rešitev. Prvi dogodek z naslovom »Kako z obnovljivimi viri do trajnostne Slovenije« je povezal več kot 40 udeležencev. Ti so opredelili šest izzivov, ki bi jih morali obravnavati, da bi – z uporabo obnovljivih materialov – Slovenija lahko prispevala k trajnostnemu razvoju:

1. Z uporabo preteklih izkušenj in znanj ter z novimi znanji in inovativnimi tehnologijami do dodane vrednosti lesa;

2. Ponovno pogozdovanje kot soustvarjanje pametnih rešitev za trajnostno družbo;

3. Spremeni vedenje za kolektivno zavest o trajnostnosti;

4. Povezovanje, usklajevanje in zaupanje med deležniki;

5. Kako združiti preteklo znanje in nove tehnologije za lepo, funkcionalno in zdravo življenje;

6. Mednarodno povezovanje.

In 2020, these events will continue with the aim to look for solutions to the winning challenges as Living Lab InnoRenew prepares a series of activities to further deepen and enhance collaboration with its partners.

V letu 2020 bo Živi laboratorij InnoRenew nadaljeval z dogodki, na katerih bo iskal rešitve za zmagovalni izziv in pripravil vrsto dejavnosti za še bolj poglobljeno sodelovanje s svojimi partnerji.

First Future Challenges event.
Image: Tatiana Abaurre Alencar Gavric
Prvi dogodek iz cikla Izzivi prihodnosti.
Foto: Tatiana Abaurre Alencar Gavric

Living Lab InnoRenew Future Challenges event. Image: Lea Primožič
Dogodek Živega laboratorija InnoRenew Izzivi prihodnosti. Foto: Lea Primožič

Scientific missions

The InnoRenew CoE invited all Living Lab InnoRenew SME members and associates to apply for a one-month scientific mission at the institute. Scientific missions are an institutional research stay to foster collaboration between the InnoRenew CoE and Living Lab InnoRenew members. Scientific missions include development of a joint research project, experimentation and a general overview of InnoRenew CoE activities.

In 2019, Mr. Chandra Bhakuni (India) was identified through the selection process, invited to Koper and completed his scientific mission at the InnoRenew CoE in December. During his stay, Mr. Bhakuni worked closely with several InnoRenew CoE researchers on the development of hybrid composites made from fiber-based materials, concrete and clay. The joint work program was selected to improve building practices in India by producing more resilient residences and schools.

Raziskovalni obiski

InnoRenew CoE je vsa mala in srednje velika podjetja, včlanjena v Živi laboratorij InnoRenew, povabil k prijavi na enomesečni raziskovalni obisk inštituta, namenjen krepitvi sodelovanja med InnoRenew CoE in člani Živega laboratorija InnoRenew. Obisk vključuje razvoj skupnega raziskovalnega projekta, izvajanje poskusov in splošni pregled dejavnosti InnoRenew CoE.

Za raziskovalni obisk je bil izbran Chandra Bhakuni iz Indije, ki je bil povabljen v Koper in je obisk na inštitutu končal decembra 2019. Med enomesečnim bivanjem je tesno sodeloval z več raziskovalci v InnoRenew CoE in se ukvarjal z razvojem hibridnih kompozitov iz vlaknenih materialov in tudi drugih gradbenih materialov, kot sta beton in glina. Odločitev za skupni delovni program Chandre Bhakunija in InnoRenew CoE je bila sprejeta z namenom, da bi z gradnjo odpornejših stanovanjskih stavb in šol izboljšali gradbene prakse v Indiji.

Research institute, which is also a research project
Raziskovalni inštitut, ki je tudi sam raziskovalni projekt

Activities associated with the construction of the institute in 2019

The plan for construction of the InnoRenew CoE building was created in 2018 and, in 2019, activities associated with the implementation of the plan followed.

In January, the **tender for construction and installation work was completed**; one bid was received, which was rejected due to excessive price. We **optimized the project** and created a corrected version, on which a new tender for construction and installation work was based. At the same time, we produced a **revision of the investment program** for the InnoRenew project, which was subsequently confirmed by all financing stakeholders. We **acquired all the approvals to start construction** and, at the end of April, we submitted an application to the Izola Administrative Unit and Republic of Slovenia's Labour Inspectorate **announcing the beginning of construction**.

On 14 May 2019, we started with **preparatory and earth-moving work** in Livade; the first phase was completed in July. Meanwhile, a plan was prepared for internal laboratory equipment and interior design of offices; a partial order was submitted and temporary offices and laboratories in Koper and Izola were furnished. Once construction is completed, the furniture will be relocated to the new facility.

A **new call for construction and installation work was published** in June; in January 2020, a contract was signed with the selected contractor.

At the same time, various **promotional activities** took place. We created pictorial and video material, which was published on the website and social networks of the institute. It was also used by the media, including television (national RTV Slovenia, TV Koper), web portal Regional Obala and the Slovenian news agency. The project was presented at two conferences – SloWOODLife in Ljubljana (in the form of a lecture) and ForestValue Outreach Seminar for International Collaboration in Buenos Aires, Argentina (in the form of a video contribution). It was also included in two Slovenian professional publications in the field of architecture. In addition, in collaboration with the University of Primorska, a virtual reality model was created, which was tested by the visitors of the SloWOODLife conference, among others.

The project team **upgraded the project content in collaboration with top international experts (USA, Finland, the Czech Republic)**. They have devised a solution that will monitor the building during construction and operation with sensors, data monitoring, data analysis,

Dejavnosti, povezane z gradnjo inštituta v letu 2019

Načrt za gradnjo stavbe InnoRenew CoE je bil narejen leta 2018, v letu 2019 pa so sledile dejavnosti, povezane z njegovo izvedbo.

Januarja se je **zaključil razpis za gradbena, obrtniška in inštalacijska** (GOI) **dela**, na katerega je prispela ena ponudba, ki pa je bila zaradi previsoke cene zavrnjena. Sledili sta **optimizacija projekta** in nov čistopis projekta za izvedbo gradnje, na podlagi katerega je bil nato objavljen nov razpis za GOI-dela. Hkrati s tem smo pripravili tudi **novelacijo investicijskega programa** projekta Innorenew CoE, ki je bila potrjena s strani vseh deležnikov financiranja. Pridobili smo **vsa soglasja** za pričetek gradnje, konec aprila pa oddali **prijavo začetka gradnje** na Upravno enoto Izola in Inšpektorat RS za delo.

Štirinajstega maja so se začela **pripravljalna in zemeljska dela** na terenu v Livadah, prva faza je bila zaključena julija. Med tem smo pripravljali načrt za notranjo opremo laboratorijev in naredil izbor notranje opreme za pisarne in delno naročilo, s katerimi so se opremile začasne pisarne in laboratoriji v Kopru in Izoli. Ko bo stavba zgrajena, bo pohištvo premeščeno v nov objekt.

Novi razpis za GOI-dela je bil objavljen junija, januarja 2020 pa je bila podpisana pogodba z izbranim izvajalcem.

Ob vsem tem so potekale različne **promocijske dejavnosti**. Izdelali smo slikovna in video gradiva, ki so bila objavljena na spletni strani in družbenih omrežjih inštituta, uporabili pa so jih tudi v medijih, med drugim na nacionalni televiziji RTV Slovenija, televiziji TV Koper, spletnem portalu Regional Obala in Slovenski tiskovni agenciji. Projekt smo predstavili na dveh konferencah, in sicer na SloWOODLife v Ljubljani (v obliki predavanja) in na Seminarju za mednarodno sodelovanje ForestValue (ForestValue Outreach seminar for International Collaboration) v Buenos Airesu v Argentini (v obliki videoprispevka), ter v dveh slovenskih strokovnih publikacijah s področja arhitekture. Poleg tega smo v sodelovanju z Univerzo na Primorskem izdelali model za virtualno resničnost, ki so ga med drugim lahko preizkusili obiskovalci konference SloWOODLife.

Ekipa, ki sodeluje pri projektu, je na delovnih sestankih **v sodelovanju z vrhunskimi strokovnjaki iz tujine (ZDA, Finska, Češka) vsebinsko nadgradila projekt**. Zasnovala je monitoring stavbe med gradnjo in pri njenem obratovanju s senzorji, monitoringom in

maintenance and implementation of digital twins and evaluation of the building's reliability and performance. It is planned to use ICT tools according to sensor outputs, which detect the location and number of users. Moreover, the use of virtual (Virtual Reality - VR) and augmented reality (Augmented Reality - AR) in the wood sector will be demonstrated.

analizo podatkov ter vzdrževanjem in implementacijo digitalnega dvojčka. Vrednotili bomo zanesljivosti in učinkovitosti delovanja stavbe s pomočjo orodij IKT glede na podatke senzorjev, ki zaznavajo lokacijo in število uporabnikov, demonstrirali pa bomo tudi uporabo navidezne (Virtual Reality – VR) in obogatene resničnosti (Augmented Reality – AR) v lesnem sektorju.

Excavation on the ground in Livade, Izola. Image: Eva Prelovšek Niemelä
Zemeljska dela na terenu v Izolskih Livadah. Foto: Eva Prelovšek Niemelä

Research concept of the institute building

In 2019, the project team elaborated on the concept of the building.

The building complex will be dedicated to employees and research, but it will also serve as a **building that is itself a research project**. It will be built not only according to verified principles of contemporary sustainable building construction but also on the ideas of the institute's researchers that have not yet been verified "live". The entire building complex will be monitored by scientists and checked simultaneously for how it works.

It starts with construction, which will consist of a hybrid combination of timber, concrete and steel. Solid timber walls will be made of cross-laminated timber panels (CLT). With the measurements to be carried out, such a **hybrid construction** will allow comparative analysis of all three materials. Construction of the upper part of the complex (1st-3rd floors) will be completely wooden, making the institute the largest wooden building in Slovenia so far.

The complex will be equipped with a smart management system, like an alarm system in the case of fire, and automatic regulation of outer screen shades and windows, depending on weather conditions. The facility will be low energy and airtight, and ventilation will be regulated by heat recovery and also by natural ventilation during peak weather conditions.

"Such a system is nothing special this day. Special will be **sensors' networks for precise monitoring** of all spaces, construction systems and façades that will be connected

Raziskovalni koncept gradnje inštituta

Na delovnih sestankih je ekipa natančneje opredelila tudi koncept zgradbe inštituta.

Gradbeni kompleks bo namenjen zaposlenim in raziskavam, obenem pa bo tudi sam v vlogi raziskovalnega objekta. Narejen bo ne le po preizkušenih načelih sodobne trajnostne gradnje, ampak bodo vanj vgrajene tudi ideje raziskovalcev inštituta, ki do zdaj še niso bile preverjene »v živo«. Celoten gradbeni kompleks bodo znanstveniki sproti spremljali z meritvami in preverjali, kako deluje.

Začne se že pri **hibridni konstrukciji**, ki bo sestavljena iz lesa, betona in jekla. Masivne lesene stene bodo iz križno lepljenih plošč (CLT). Z meritvami, ki se bodo izvajale, bo takšna hibridna konstrukcija omogočila primerjalne analize vseh treh materialov. Konstrukcija zgornjega dela kompleksa (1.—3. nadstropje) bo v celoti lesena, zato bo inštitut največja lesena zgradba v Sloveniji doslej.

Kompleks bo opremljen s sistemom za pametno upravljanje, kot je denimo alarmni sistem v primeru požara ali samodejno uravnavanje senčil ter oken glede na vremenske razmere. Objekt bo nizkoenergijski in zrakotesen, prezračevanje pa bo urejeno z rekuperacijo odpadne toplote, vendar bo ob vremenskih konicah uravnavan tudi z naravnim zračenjem.

»Tak sistem ni danes nič posebnega, posebnost pa bodo **mreže senzorjev za natančen monitoring** vseh

to the smart management system," says the architect Eva Prelovšek Niemelä.

These sensors will measure various parameters, from temperature, humidity, acoustics, dust and emissions to static loads, aging of wood on façades, biotic, chemical and physical quantities. All monitored data will be mapped to BIM libraries (Building Information Modelling) and to the Building Management System (BMS). This will give researchers an insight into the way wood is aging in buildings and enable easier planning of timber construction in the future.

Sensors will be partly developed by researchers. They will study set up, modification and upgrading of sensor systems and interactions among them inside decentralized systems using the latest artificial intelligence technologies, edge computing and blockchain.

The interior of the building will be, for the first time in Slovenia, equipped according to the **principles of REED** (Restorative Environmental and Ergonomic Design). This means that it will be based upon results of the institute's current research regarding the amount of wood needed for optimal effects on human well-being. The same principle will also regulate the quality and temperature of the air, humidity, surface temperature, color and acoustics.

Layout of rooms and interior fittings will be **designed on the basis of research on the importance of movement during work** (active office). Materials to be touched, such as railings, doors, electric switches and furniture, will be selected according to results of the institute's current research on the type of wood most likely to affect human well-being. Researchers will make certain countertops in laboratories and tea kitchens act as test surfaces made of modified wood.

prostorov, konstrukcijskih sistemov in fasad, ki bodo povezane s sistemom za pametno upravljanje,« pravi arhitektka Eva Prelovšek Niemelä. Senzorji bodo merili različne parametre, od temperature, vlage, akustike, prahu in emisij do statičnih obremenitev, staranja lesa na fasadah, biotskih, kemičnih in fizikalnih količin. Vse podatke monitoringa se bo vpisovalo v knjižnice BIM (ang. Building Information Modelling – informacijsko modeliranje gradnje) in v sistem za pametno upravljanje (ang. Building Management System – BMS). To bo omogočalo vpogled v način staranja lesa v stavbah in lažje načrtovanje lesene gradnje v prihodnosti.

Senzorje bodo raziskovalci deloma razvili sami in proučevali vgrajevanje, spreminjanje in nadgrajevanje sistemov tipal ter njihovo medsebojno interakcijo v decentraliziranih sistemih z uporabo najnovejših tehnologij umetne inteligence, računalništva na robu (edge computing) in veriženja podatkovnih blokov (blockchain).

Notranjost zgradbe bo, in to prvič v Sloveniji, **opremljena po načelih REED** (ang. Restorative Environmental and Ergonomic Design – restorativno okoljsko in ergonomsko oblikovanje), kar med drugim pomeni, da bo temeljila na rezultatih aktualnih raziskav inštituta o tem, kolikšna količina lesa doseže optimalne učinke na dobro človekovo počutje; po enakem načelu bodo uravnavane tudi kakovost in temperatura zraka, vlaga, temperatura površine, barve in akustika.

Razpored prostorov in notranje opreme bo **zasnovan po izsledkih raziskav o pomenu gibanja med delom** (aktivna pisarna). Materiali na dotik, kot so ograje, vrata, stikala, pohištvo, bodo prav tako izbrani glede na rezultate aktualnih raziskav inštituta o tem, kakšna struktura in vrsta lesa najugodneje vplivata na človekovo počutje, določene delovne površine v laboratorijih ali čajnih kuhinjah pa bodo raziskovalci sami izdelali kot testne površine iz modificiranega lesa.

1.400 m2 walkable green roof terraces will also serve as an open-air test site. Image: InnoRenew CoE / Inštitut bo imel 1.400 m2 zatravljenih pohodnih strešnih teras, ki bodo uporabljene tudi za testni poligon na prostem. Foto: InnoRenew CoE

The new InnoRenew CoE building. Image: InnoRenew CoE / Nova stavba InnoRenew CoE. Foto: InnoRenew CoE

Terraces will be a gathering place for employees. Image: InnoRenew CoE / Terase bodo tudi prostor za druženje zaposlenih. Foto: InnoRenew CoE

Main entrance on the south façade. Image: InnoRenew CoE / Južna fasada z glavnim vhodom. Foto: InnoRenew CoE

On the roof, there will be solar collectors and a weather station, which is one of the key elements for predicted monitoring. All building roofs are flat, designed as extensive green roofs, thus realizing the principle that we should return to nature what we took from it, and, at the same time, strengthening the insulation of the building. But that's not all; **roof terraces will also serve as an open-air test site**. Thus, the institute will provide the wood industry with space, research equipment and analysis of data for testing their wooden products or buildings.

Streha, na kateri bodo nameščeni sončni kolektorji za ogrevanje vode in vremenska postaja, ki je eden od ključnih elementov za predvidene meritve, bo zatravljena, s čimer se bo uresničevalo načelo, da naj bi naravi vrnili, kar smo ji vzeli, in obenem okrepilo izolacijo stavbe. A to še ni vse; **pohodne strešne terase bodo namreč služile tudi kot testni poligon na prostem**. Inštitut bo lesni industriji tako nudil prostor, raziskovalno opremo ter zbiranje in analizo podatkov za testiranje njihovih lesnih izdelkov oziroma objektov.

Building a bridge to industry: InnoRenew CoE invests in infrastructure

Most do industrije: InnoRenew CoE vlaga v infrastrukturo

New infrastructure has enriched our capability to conduct high-quality research at the InnoRenew CoE. We have acquired laboratory equipment and testing machines that will further our ability to contribute to science and the economy.

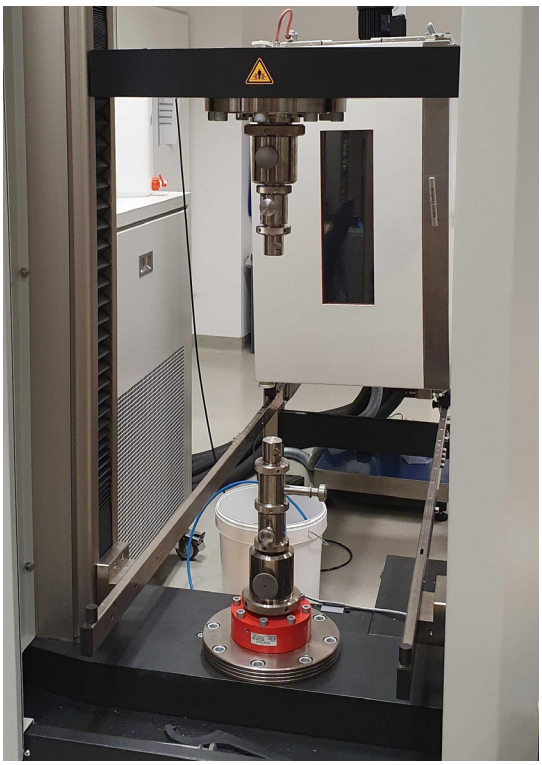
Our current research topics are diverse and include wood modification, human health in the built environment, cultural heritage protection, the bioeconomy, graph theory, wood-based value chains, e-learning platforms and more. With the research work and services that we offer to our partners, we are building a bridge between research and industry. New labs and infrastructure expand the possibilities, and today we can offer a wide range of laboratory and other services to bolster competitiveness and strengthen performance in diverse areas.

The InnoRenew CoE has specialty equipment, **co-funded by the European Regional Development Fund through Slovenia's Ministry of Education, Science and Sport**, for industry utilization and research projects with quality testing and research available in six labs.

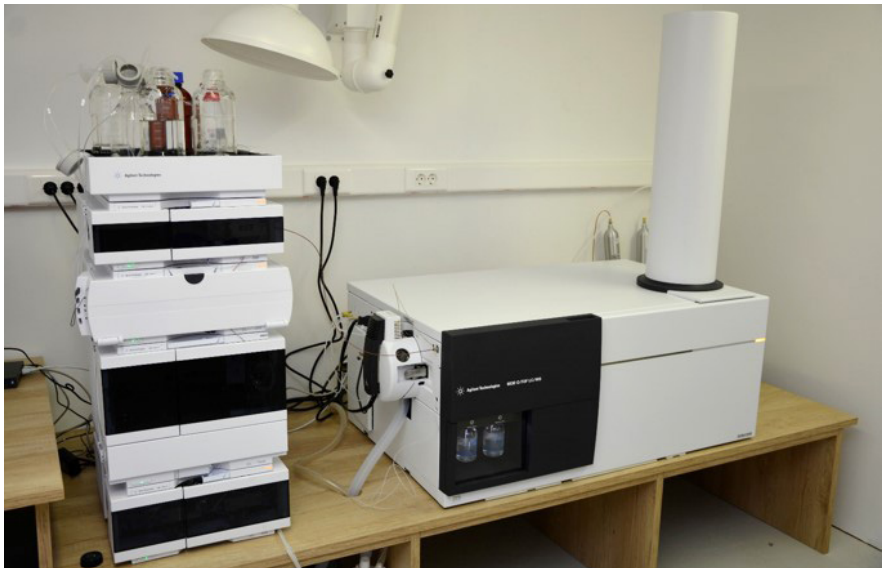
Zmogljivosti za opravljanje visokokakovostnih raziskav smo v InnoRenew CoE obogatili z novo infrastrukturo – pridobili smo laboratorijsko opremo in preizkuševalnike, s katerimi bomo lahko še več prispevali k znanosti in gospodarstvu.

Naše trenutne raziskovalne teme, ki so zelo raznolike, vključujejo modifikacijo lesa, zdravje ljudi v grajenem okolju, varstvo kulturne dediščine, biogospodarstvo, teorije grafov, gozdno-lesne vrednostne verige, platforme za e-učenje in še več. Z raziskovalnim delom in storitvami, ki jih ponujamo našim partnerjem, gradimo most med raziskavami in industrijo. Novi laboratoriji in infrastruktura širijo možnosti, in danes lahko ponudimo široko paleto laboratorijskih in drugih storitev, s katerimi krepimo konkurenčnost in povečujemo zmogljivosti na različnih področjih.

Specializirana oprema, ki jo ima InnoRenew CoE v svojih šestih laboratorijih in jo je **sofinanciralo Ministrstvo za šolstvo, znanost in šport RS iz Evropskega sklada za regionalni razvoj**, omogoča kakovostno testiranje in raziskovanje tako za industrijo kot raziskovalne projekte.



Zwick/Roell Z100 can assess how bio-based products perform in various environmental conditions. Image: InnoRenew CoE / Zwick/Roell Z100 lahko oceni delovanje bioloških izdelkov v različnih okoljskih pogojih. Foto: InnoRenew CoE



Agilent 6500 LC/MS Q-TOF system can be used to identify unknown compounds. Image: InnoRenew CoE / Za določanje neznanih spojin lahko uporabimo sistem Agilent 6500 LC/MS Q-TOF. Foto: InnoRenew CoE

Labs

In the **characterization lab**, a unique set of equipment allows our team and visitors to learn more about materials and how their composition and performance changes over time or in response to treatments or exposure. Our **microscopy** tools allow us to gather scientifically and industrially relevant information about wood treatment processes, performance and measurement of surface characteristics at the micron level. The **physical testing lab** allows the InnoRenew CoE to test mechanical properties of renewable materials and bio-based composites to determine performance in various uses, conditions and structural applications. In the **human health in the built environment lab**, we have a variety of equipment to analyze how materials and built environments impact human psychological and physiological well-being and assess cognitive and physical performance in different environments. One of the InnoRenew CoE's research areas is dedicated to **renewable materials composites**; therefore, we have a lab with specialty devices to create composites from biomaterials that add value, extend the lifecycle and improve performance in a wide range of consumer products. In our **woodworking lab**, we can prepare samples and for product development, testing and analysis.

Invitation to collaborate

The InnoRenew CoE is open to collaboration. Our new equipment is available for outside researchers, industry members or other interested individuals, with whom we develop creative and important research through partnership agreements. Namely, innovative products and solutions for many challenges we are facing as a society can be developed in our labs, and we are glad to contribute our part for a better tomorrow.

Equipment purchased in 2019 is listed in Table 5.

Laboratoriji

Edinstven nabor opreme v **laboratoriju za karakterizacijo** omogoča naši ekipi in obiskovalcem, da poglabljamo znanje o materialih in o tem, kako se njihova sestava in delovanje spreminjata s časom in odzivata na obdelavo ali izpostavljenost neugodnim vremenskim razmeram. Naše **priprave za mikroskopiranje** nam omogočajo zbiranje podatkov o postopkih obdelave lesa – delovanju materialov in merjenju njihovih površinskih lastnosti na ravni mikronov –, ki so pomembni tako za industrijo kot znanstvene raziskave. **Laboratorij za fizikalno testiranje** omogoča InnoRenew CoE preizkušanje mehanskih lastnosti obnovljivih materialov in kompozitov, narejenih na osnovi bioloških materialov, ki je namenjeno proučevanju njihovega delovanja pri različnih rabah, pogojih in konstrukcijskih izvedbah. V **laboratoriju za raziskovanje zdravja ljudi** v grajenem okolju imamo raznoliko opremo za analizo vpliva materialov in grajenega okolja na psihološke in fiziološke indikatorje človekovega zdravja in dobrega počutja ter za ocenjevanje kognitivne in telesne zmogljivosti ljudi v različnih okoljih. Eno od raziskovalnih področij InnoRenew CoE je posvečeno **kompozitom iz obnovljivih materialov**, zato imamo laboratorij s specializiranimi pripomočki za ustvarjanje kompozitov iz biomaterialov, ki prinašajo dodano vrednost, podaljšujejo življenjsko dobo in izboljšujejo učinkovitost širokega spektra potrošniških izdelkov. V našem **mizarskem laboratoriju** lahko pripravimo vzorce za razvijanje izdelkov, testiranje in analizo.

Sodelovanja

InnoRenew CoE je odprt za sodelovanja. Naša nova oprema je zato na voljo tudi zunanjim raziskovalcem, predstavnikom industrije in drugim zainteresiranim posameznikom, s katerimi v partnerskem dogovoru izvajamo ustvarjalne in pomembne raziskave. Naši laboratoriji namreč omogočajo razvijanje inovativnih izdelkov in rešitev za številne izzive, s katerimi se kot družba soočamo; veseli nas, da prispevamo svoj delež za boljši jutri.

Seznam opreme, pridobljene v letu 2019, je naveden v preglednici 5.

Organized events
Organizirani dogodki

In 2019, the InnoRenew CoE organized or co-organized 24 events. In addition to our second anniversary celebration, we organized workshops, meetings, special events, exhibitions, student group visits, partner celebrations and an international conference. We also hosted a Euronews team assigned to create a short video documenting how InnoRenew CoE is influencing the sustainable housing sector in Europe.

V letu 2019 smo v InnoRenew CoE organizirali in soorganizirali 24 dogodkov. Poleg praznovanja naše druge obletnice smo pripravili delavnice, srečanja, posebne prireditve, razstave, skupinske obiske tujih študentov, slovesnosti projektnih partnerjev in mednarodno konferenco. Gostili smo tudi obisk snemalne ekipe Euronewsa, ki je posnela video o vplivu našega dela na področje trajnostne gradnje v Evropi.

Table 1: Events organized by the InnoRenew CoE

Preglednica 1: Dogodki, ki jih je organiziral InnoRenew CoE v letu 2019

	Event	Purpose	Location	Date
1	Bordeaux Sciences Agro student visit	To present InnoRenew CoE and its research to visiting students	Koper, Slovenia	17/1/2019
2	COST Action FP1407 WG4 Workshop: Treatment methods, including manufacturers and sales & production	To host a one-day workshop for COST Action FP1407 members and industry representatives	Koper, Slovenia	4/2/2019
3	InnoRenew CoE second anniversary	To meet with the Minister of the Republic of Slovenia Ministry of Education, Science and Sport and celebrate InnoRenew CoE results	Koper, Slovenia	15/2/2019
4	InnoRenew project partners meeting	To discuss InnoRenew project development	Koper, Slovenia	4/3/2019 - 5/3/2019
5	InnoRenew CoE second anniversary celebration	To meet with InnoRenew project funders, founders, partners and other stakeholders and celebrate InnoRenew CoE results	Koper, Slovenia	4/3/2019
6	InnoRenew CoE 1st International Conference: Timber -- A healthy future for sustainable buildings	To host a one-day conference to share and discuss research and findings from the field of human health and sustainable built environments	Koper, Slovenia	7/3/2019
7	Charm of cooperation: International collaboration for an innovative forest-based value chain	To organize a one-day conference in conjunction with Slovenia's annual "Charm of Wood" exhibition and disseminate knowledge about the role of science in wood innovation to a broad audience of researchers, government agencies and the public	Ljubljana, Slovenia	13/5/2019
8	University of Kansas student visit	To present InnoRenew CoE and its research to visiting students	Koper, Slovenia	24/5/2019
9	Pulp and Paper Institute new infrastructure	To present newly acquired equipment and tour new laboratory infrastructure financed through the InnoRenew project	Ljubljana, Slovenia	4/6/2019
10	Charm of Wood in Koper	To officially open the "Charm of Wood" traveling exhibition with presentations by local wood products companies	Koper, Slovenia	5/7/2019
11	InnoRenew project partners meeting	To discuss progress of the InnoRenew project, emphasize WP6 activities and hold a general assembly meeting	Koper, Slovenia	3/9/2019
12	Euronews documentary	To participate in filming of a Euronews documentary about the InnoRenew project and InnoRenew CoE research	Koper, Slovenia	3/9/2019 - 4/9/2019
13	Papiro-logia	To showcase circular design and interior uses for paper products	Krško, Slovenia	3/9/2019 - 20/9/2019
14	Graz University of Technology Alumni	To host a one-day workshop about InnoRenew CoE research groups and hold discussions with several Austrian companies	Koper, Slovenia	6/9/2019

	Event	Purpose	Location	Date
15	First Slovene Plasma Day	To co-host a one-day workshop about plasmas and plasma applications for use in different industries	Ljubljana, Slovenia	30/9/2019
16	Living Lab InnoRenew Future Challenges series: How to make Slovenia sustainable with renewable materials	To host a one-day event to discuss the role of renewable materials in sustainable development, identify challenges in this area and network with participants	Koper, Slovenia	3/10/2019
17	Let's explore wood	To spread knowledge about wood as a renewable, healthy material and the application of ergonomics	Koper and Izola, Slovenia	17/10/2019, 19/10/2019, 23/10/2019, 24/10/2019
18	Institute for the Protection of Cultural Heritage of Slovenia new infrastructure	To present newly acquired equipment and tour new laboratory infrastructure financed through the InnoRenew project	Ljubljana, Slovenia	7/11/2019
19	InnoRenew CoE employee training on gender-related issues	To educate and train InnoRenew CoE employees on gender-related issues in research and innovation	Koper, Slovenia	8/11/2019
20	Future of wood science education in Europe	To discuss wood science and technology education as a tool to address global challenges associated with intensified demand for wood products; strategize evolution of the wood science discipline; identify best practices and paths to meet these challenges and demands	Koper, Slovenia	14/11/2019 - 15/11/2019
21	Let's explore wood	To spread knowledge about wood as a renewable, healthy material and the application of ergonomics	Koper and Izola, Slovenia	15/11/2019, 16/11/2019
22	Pro-Enrich general assembly	To discuss Pro-Enrich project development; plan for possible problems and future activities	Koper, Slovenia	18/11/2019 - 19/11/2019
23	Biomass utilization in the EU	To host a workshop with Pro-Enrich partners and InnoRenew CoE researchers to discuss biomass utilization in Europe	Koper, Slovenia	20/11/2019
24	InnoRenew CoE Council of Experts fifth meeting	To present InnoRenew CoE developments and discuss future plans and activities	Koper, Slovenia	3/12/2019

InnoRenew CoE notable events

On 15 February 2019, we celebrated our second anniversary with Dr. Jernej Pikalo, Republic of Slovenia Minister of Education, Science and Sport, Danilo Markočič, Mayor of Izola and Dr. Dragan Marušič, previous rector of the University of Primorska.

Pomembnejši dogodki, ki jih je organiziral InnoRenew CoE

Petnajstega februarja 2019 smo skupaj z ministrom za izobraževanje, znanost in šport dr. Jernejem Pikalom, županom Izole Danilom Markočičem in takratnim rektorjem Univerze na Primorskem dr. Draganom Marušičem praznovali svojo drugo obletnico.

"We all strive to reach the international nature. This is the first time it was actually done, and, in this sense, I sincerely congratulate all of you." – Dr. Jernej Pikalo, Minister of Education, Science and Sport.

»Vsi stremimo k internacionalizaciji. Tokrat pa se je to prvič dejansko tudi zgodilo, in zato vam čestitam.« – Dr. Jernej Pikalo, minister za izobraževanje, znanost in šport

InnoRenew CoE team with Dr. Jernej Pikalo, Danilo Markočič and Dr. Dragan Marušič. Image: Alen Ježovnik
Ekipa InnoRenew CoE z ministrom dr. Jernejem Pikalom, županom Izole Danilom Markočičem in takratnim rektorjem Univerze na Primorskem dr. Draganom Marušičem. Foto: Alen Ježovnik

We also celebrated our second anniversary with InnoRenew project funders, partners and industrial collaborators in March 2019. For this occasion, we held a roundtable for the University of Primorska, Fraunhofer WKI, Institute for the Protection of Cultural Heritage of Slovenia and the Slovenian National Building and Civil Engineering Institute (the InnoRenew CoE founders) to share their thoughts about how it all started, achieved results and the institute's future development.

Drugo obletnico smo 4. marca 2019 nato praznovali skupaj z ustanovitelji ter projektnimi in industrijskimi partnerji. Ob tem smo pripravil okroglo mizo, na kateri so predstavniki naših ustanoviteljev – Univerza na Primorskem, nemški inštitut Fraunhofer WKI, Zavod za gradbeništvo Slovenije ter Zavod za varstvo kulturne dediščine Slovenije – občinstvu razkrili svoje spomine na začetke InnoRenew CoE in razmisleke o doseženih rezultatih, predstavili pa so tudi svoja videnja o njegovi prihodnosti.

InnoRenew CoE founders at the second anniversary roundtable. Image: Alen Ježovnik / Ustanovitelji InnoRenew CoE na okrogli mizi. Foto: Alen Ježovnik

"I still remember when I found out that the application was successful. I was at a conference in Slovakia. I must admit that I was not sure that they will go all the way, but I am very happy that they did. I see the InnoRenew CoE as the best opportunity for this region and for Slovenia as a whole. This team, their work and the way of working impressed me very much." – Dr. Dragan Marušič, previous rector of the University of Primorska.

»Še danes se spomnim trenutka, ko sem izvedel, da je bila prijava uspešna. Bil sem na konferenci na Slovaškem. Priznati moram, da nisem bil čisto prepričan, ali bo prijava uspešna, in zelo sem vesel, da je bila. InnoRenew CoE vidim kot najboljšo priložnost za to regijo pa tudi za Slovenijo na splošno. Ta ekipa, njihovo delo in način dela so me zelo navdušili.« – Dr. Dragan Marušič, takratni rektor Univerze na Primorskem

The InnoRenew CoE 1st International Conference: Timber – A healthy future for sustainable buildings was held in March 2019. The conference brought to Koper more than 60 experts from across Europe to present and discuss the latest findings about health, sustainability and wood in the built environment. The keynote speaker was Dr. Ed Suttie, research director at BRE, the world's leading building science center. Several InnoRenew CoE researchers also presented their topics and research findings.

Marca 2019 smo organizirali 1. Mednarodno konferenco InnoRenew CoE »Les – zdrava prihodnost za trajnostne zgradbe«, ki je v Koper privabila več kot 60 strokovnjakov z različnih koncev Evrope, kjer so predstavili najnovejša dognanja o zdravju, trajnostnosti in vlogi lesa v grajenem okolju. Glavni govornik na konferenci je bil dr. Ed Suttie, direktor za raziskave v BRE (Building Research Establishment) Group, znanstvenem centru na področju gradnje. Na konferenci so svoje raziskave in rezultate predstavili tudi številni raziskovalci iz InnoRenew CoE.

"Materials scientists develop new materials, designers implement them by creating surrounding objects and architects use them to create buildings where we spend most of our time. I explain how people are perceiving materials in their environments and how materials reception is related to their expectations and satisfaction rate." – Dr. Anna Sandak, InnoRenew CoE research group leader for Wood Modification.

»Znanstveniki razvijajo nove materiale, oblikovalci jih uporabijo pri izdelavi predmetov, arhitekti pa za ustvarjanje zgradb, kjer ljudje preživimo večino časa. Moja raziskava pojasnjuje, kako ljudje zaznavamo materiale in kako je to zaznavanje povezano z našimi pričakovanji ter stopnjo zadovoljstva uporabnikov.« – Dr. Anna Sandak, vodja raziskovalne skupine Modifikacija lesa v InnoRenew CoE, ki je na konferenci obravnavala zaznavanje materialov

"Society's need for housing, workspaces and other parts of the built environment increases with population growth, inhabitants' changing preferences and demographic dynamics. With design, the construction and use of buildings makes it possible to create positive health impacts, provide environmental benefits and improve social outcomes for their occupants." – Dr. Michael Burnard, InnoRenew CoE deputy director and research group leader for Human Health in the Built Environment.

»Potrebe družbe po stanovanjskih rešitvah, poslovnih prostorih in ostalih grajenih okoljih se povečujejo, saj število prebivalstva narašča, želje prebivalcev se spreminjajo, prav tako pa ne gre zanemariti demografske dinamike. Z oblikovanjem, grajenjem in uporabo zgradb lahko ustvarimo učinke, ki pozitivno vplivajo na zdravje in okolje.« – Dr. Michael Burnard, namestnik direktorice in vodja raziskovalne skupine Človekovo zdravje v grajenem okolju v InnoRenew CoE

InnoRenew CoE 1st international conference. Image: InnoRenew CoE
Prva mednarodna konferenca InnoRenew CoE. Foto: InnoRenew CoE

For the third consecutive year, InnoRenew CoE collaborated and co-organized the Charm of Wood traveling exhibition, which was open for visits at the University of Primorska during July 2019. For over a decade, Charm of Wood has been promoting and fostering the use of wood and wood products, raising awareness about the sustainability of this natural material.

Tretje leto zapored smo soorganizirali potujoči del razstave Čar lesa in sodelovali tudi pri spremljevalnih dogodkih. Razstava je bila na ogled julija v prostorih Univerze na Primorskem.
Prireditev Čar lesa že dobro desetletje promovira in spodbuja rabo lesa in lesenih izdelkov ter ozaveščа o trajnostnem vidiku rabe tega naravnega materiala.

"We want to bring wood and wooden products closer to everyone and not only to professionals involved in the forest-wood chain. This exhibition is a great example of this." – Dr. Andreja Kutnar, director of the InnoRenew CoE.

»Les in lesene izdelke si želimo približati vsem in ne le strokovnjakom, ki so vključeni v gozdno-lesno verigo. Ta razstava je odlična priložnost za to.« – Dr. Andreja Kutnar, direktorica InnoRenew CoE

Charm of Wood 2019. Image: Alen Ježovnik
Čar lesa 2019. Foto: Alen Ježovnik

The first event of the Living Lab InnoRenew Future Challenges series, "How to make Slovenia sustainable with renewable materials", was held in October 2019. Participants discussed the role of renewable materials in sustainable development, how renewable materials contribute to human well-being and the part digitalization plays in both. Participants then co-created solutions for challenges important to them or for their organizations, including international collaboration, co-creation of smart solutions and consolidation of past experience and expertise with today's innovation, new knowledge and technology. Participants pointed out that steps taken should begin with collective sustainable development and put ecological needs before individual ones. The event was attended by more than 45 researchers, policy makers, entrepreneurs and interested individuals, including Anton Danilo Ranc, Director-General of the Wood Industry Directorate, Republic of Slovenia Ministry of Economic Development and Technology. The opportunity to actualize and implement the ideas developed will be given at the next Living Lab InnoRenew Future Challenges series event.

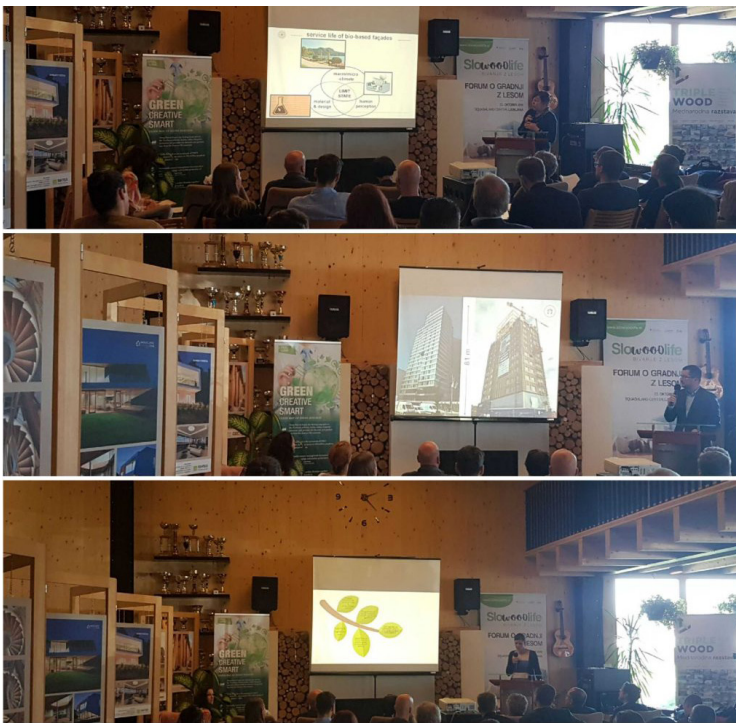
Living Lab InnoRenew Future Challenges event. Image: Lea Primožič
Dogodek Živega laboratorija InnoRenew Izzivi prihodnosti. Foto: Lea Primožič

Also in October 2019, InnoRenew CoE participated in the SloWOODlife event held at Squashland in Ljubljana, Slovenia. Several researchers had presentations about different approaches and practices for sustainable excellence and construction of massive timber buildings. Their contributions were also published in the magazine Varčna hiša.

In late 2019, InnoRenew CoE began reaching out to younger generations to share knowledge and introduce professions through a newly developed workshop for elementary school students called "Let's explore wood",

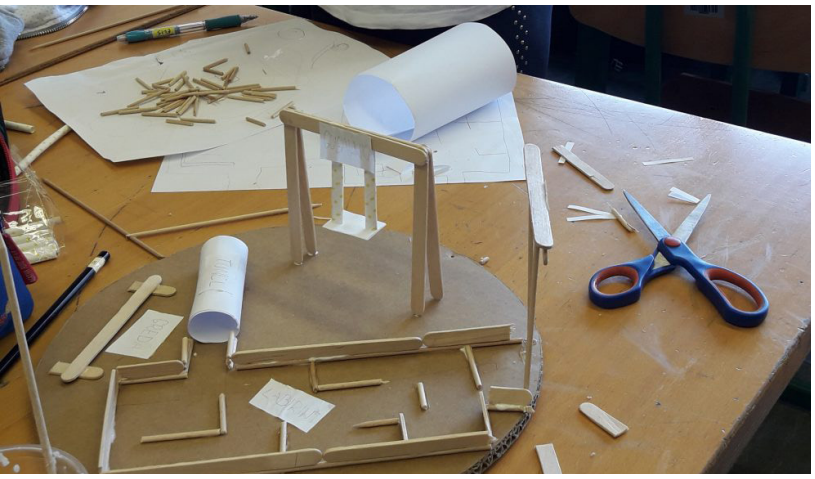
Leta 2019 smo v okviru Živega laboratorija InnoRenew zasnovali cikel dogodkov Izzivi prihodnosti in oktobra pod naslovom Kako z obnovljivimi materiali do trajnostne Slovenije organizirali prvi dogodek. Udeleženci so na prireditvi razpravljali o pomenu obnovljivih materialov za trajnostni razvoj in o tem, kako ti prispevajo k večji kakovosti našega življenja in kakšna je pri tem vloga digitalizacije. V interaktivnem delu dogodka je potekala delavnica, na kateri so udeleženci s pomočjo moderatorja iskali in soustvarjali rešitve za izzive, pomembne zanje ali za njihove organizacije. Obravnavali so številne zanimive izzive, kot so mednarodno povezovanje, soustvarjanje pametnih rešitev in povezovanje preteklih izkušenj in znanja s sodobnimi inovacijami ter novimi spoznanji in tehnologijami. Poudarili so, da je treba začeti s kolektivnim trajnostnim razvojem in ekološke potrebe postaviti pred individualne. Dogodka se je udeležilo več kot 45 raziskovalcev, oblikovalcev politik, podjetnikov in zainteresiranih posameznikov. Med udeleženci je bil tudi generalni direktor Direktorata za lesarstvo z Ministrstva za gospodarski razvoj in tehnologijo Anton Danilo Ranc. Priložnost za konkretiziranje in udejanjanje omenjenih idej bo v letu 2020, ko bo Živi laboratorij InnoRenew pripravil naslednji dogodek iz serije Izzivi prihodnosti.

Poleg tega smo sodelovali pri dogodku Bivanje z lesom – SloWOODlife, ki smo se ga tudi udeležili. Prireditev je potekala 23. oktobra 2019 v Squashlandu v Ljubljani. Številni raziskovalci iz InnoRenew CoE so na dogodku predstavili različne pristope in prakse, usmerjene v trajnostno odličnost in gradnjo lesenih stavb večjih dimenzij. Njihove teme in predstavitve so objavljene v reviji *Varčna hiša.*



Dr. Anna Sandak, Dr. Iztok Šušteršič and Kim Turk Mehes at the Living with wood – SloWOODlife event. Image: Lea Primožič
Dr. Anna Sandak, dr. Iztok Šušteršič in Kim Turk Mehes na dogodku Bivanje z lesom – SloWOODlife. Foto: Lea Primožič

which brings wood closer to young people to familiarize them with its renewable properties, present its wide range of applications and show its positive impact on human well-being. In addition to enhancing public sensitivity for the natural environment, InnoRenew CoE improved its visibility and recognition in the local area. Eight of these workshops were held with different groups of students, along with four technical days, two career guidance workshops, one workshop in the framework of the "Zeleno pero" project and one workshop for talented students. Through "Let's explore wood" students were able to learn about the importance of the InnoRenew CoE, its activities and profiles of professions employed there: kinesiologist, architect and experts in the fields of renewable materials composites and sustainable building with renewable materials. Moreover, students tested mechanical properties of different types of wood in the laboratory and made models from wood and other natural materials for toys and furniture in their school surroundings.



Workshop at the elementary school in Livade. Image: Vesna Starman
Delavnica v Osnovni šoli Livade. Foto: Vesna Starman

V InnoRenew CoE želimo svoje znanje prenašati na mlajše generacije in jih seznanjati tudi z našimi poklici. V letu 2019 smo zato začeli izvajati delavnice za osnovnošolce, ki smo jih poimenovali Raziskujmo les (Let's explore wood).

Zasnovane so z namenom, da mladim približamo les, jih seznanimo z lastnostmi tega obnovljivega materiala in jim predstavimo široko paleto njegove uporabnosti pa tudi njegov pozitiven vpliv na človekovo počutje. Z izvajanjem delavnic smo spodbujali tankočuten odnos do naravnega okolja, doprinesli pa smo tudi k večji prepoznavnosti našega raziskovalnega inštituta v širši okolici.

V letu 2019 smo za osnovnošolce pripravili osem različnih dejavnosti oziroma delavnic. Izvedli smo štiri tehniške dneve, eno delavnico v okviru projekta Zeleno pero, eno delavnico za nadarjene študente ter dve delavnici, namenjeni poklicnemu usmerjenju. Otroci so tako spoznali pomen in dejavnosti InnoRenew CoE in se seznanili z nekaterimi poklicnimi profili naših zaposleni – kineziologa, arhitekta, strokovnjaka s področja kompozitov iz obnovljivih materialov in strokovnjaka za trajnostno gradnjo z obnovljivimi materiali. Učenci so med drugim v laboratoriju preizkušali mehanske lastnosti različnih vrst lesa in izdelovali makete iz lesa in drugih naravnih materialov. Pripravili so tudi makete igral, kakršnih si želijo v šolski okolici, in šolskega pohištva.

InnoRenew project notable events

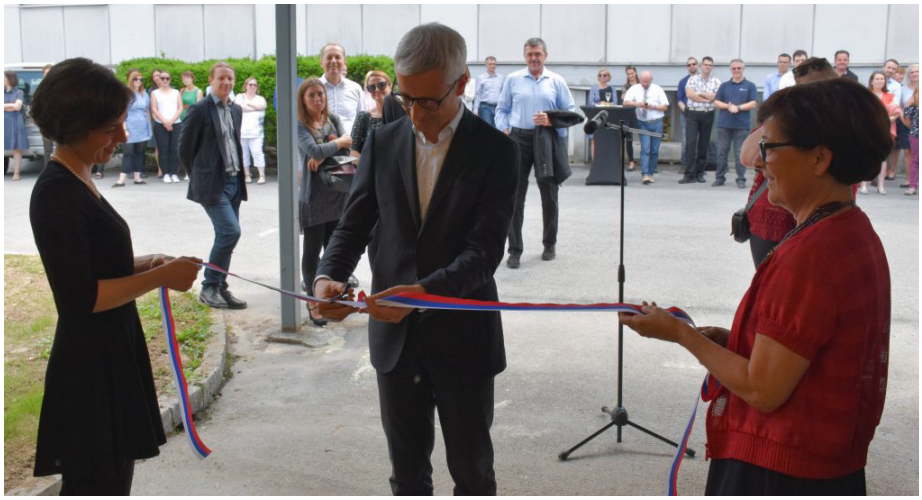
Two InnoRenew project partners successfully completed infrastructure investments and organized official openings and presentations of new laboratories and equipment that were purchased with European funds from the Horizon 2020 programme, the European Regional Development Fund and co-financing from the Republic of Slovenia's Ministry of Education, Science and Sport.

In June 2019, the Pulp and Paper Institute (ICP) unveiled its upgraded research infrastructure and state-of-the-art equipment for comprehensive study of renewable fiber materials. ICP established a modernized center for the characterization and functionalization of fiber materials, which represents a special research infrastructure for the InnoRenew project and is unique to Slovenia.

Pomembnejši dogodki projekta InnoRenew

Leta 2019 sta dva partnerja projekta InnoRenew uspešno izpeljala investicijo v infrastrukturo in ob tej priložnosti organizirala uradno odprtje s predstavitvijo novih laboratorijev in opreme, ki sta jo pridobila s sredstvi iz programa Obzorje 2020 in iz Evropskega sklada za regionalni razvoj ter s sofinanciranjem Republike Slovenije (Ministrstvo za izobraževanje, znanost in šport).

Junija 2019 je Inštitut za celulozo in papir (ICP) predstavil svojo nadgrajeno raziskovalno infrastrukturo in najsodobnejšo opremo za celostno proučevanje obnovljivih vlakninskih materialov. S tem je postavil posodobljen center za karakterizacijo in funkcionalizacijo vlakninskih materialov, ki predstavlja posebno raziskovalno enoto v skupni infrastrukturi projekta InnoRenew in je edinstven ne le v Sloveniji, ampak tudi širše.



Dr. Andreja Kutnar, Dr. Jernej Pikalo and mag. Mateja Mesl officially open the Pulp and Paper Institute completed infrastructure investments. Image: Lea Primožič
Dr. Andreja Kutnar, minister za izobraževanje, znanost in šport dr. Jernej Pikalo in direktorica Inštituta za celulozo in papir mag. Mateja Mešl uradno odpirajo Center za karakterizacijo in funkcionalizacijo vlakninskih materialov Inštituta za celulozo in papir. Foto: Lea Primožič

"With modern research infrastructure, we will contribute to Slovenia's competitive integration into R&D in the perspective field of circular bio-economy and in the emerging markets for sustainable solutions." – Mag. Mateja Mešl, director of ICP.

»S sodobno raziskovalno infrastrukturo bomo doprinesli h konkurenčnemu vključevanju Slovenije v raziskave in razvoj na perspektivnem področju krožnega biogospodarstva in na rastočih trgih trajnostnih rešitev.« – Mag. Mateja Mešl, direktorica zasebnega neprofitnega zavoda ICP

In November 2019, the Protection of Cultural Heritage of Slovenia (ZVKDS) presented its infrastructure investment. ZVKDS contributes significantly to cultural heritage research in Slovenia. Through the InnoRenew project, the institute opened the Laboratory for Characterisation of Ligno-cellulosic Materials.

Novembra 2019 je svojo infrastrukturno investicijo predstavil Zavod za varstvo kulturne dediščine Slovenije (ZVKDS). ZVKDS pomembno prispeva k raziskavam na področju kulturne dediščine v Sloveniji. S pomočjo projekta InnoRenew je odprl Laboratorij za karakterizacijo ligno-celuloznih materialov.

"This is an institution which was dealing with heritage mostly from the administrative point of view. For the first time, we are present in the science area with high technological equipment, together with the University of Primorska and the InnoRenew CoE." – Janez Kromar, director of ZVKDS.

»To je ustanova, ki se je z dediščino ukvarjala predvsem z upravnega vidika. Prvič se, skupaj z Univerzo na Primorskem in z InnoRenew CoE, pojavljamo v znanstvenih krogih z visokotehnološko opremo.« – Janez Kromar, v. d. generalnega direktorja ZVKDS

Dr. Andreja Kutnar speaks at the Institute for the Protection of Cultural Heritage of Slovenia event celebrating its completed infrastructure investments. Image: ZVKDS
Dr. Andreja Kutnar med govorom na slavnostnem dogodku ob zaključku investicije v infrastrukturo Zavoda za varstvo kulturne dediščine Slovenije (ZVKDS). Foto: ZVKDS

Human resources
Človeški viri

In 2019, the InnoRenew CoE workforce grew by 12 employees with the addition of six new scientists, four new support and business development positions and two new technicians, which bring the total to 58 employees (40 scientists, 15 support and business development positions and three technicians).

InnoRenew CoE employees hail from 15 countries, including Belgium, Brazil, Bosnia and Herzegovina, Croatia, the Czech Republic, Finland, France, Hungary, India, Italy, Norway, Poland, Sweden, Thailand and the USA. International employees make up 51 percent of the institute's total workforce.

V letu 2019 se je ekipa InnoRenew CoE povečala za 12 novih zaposlencev – šest na oddelku za raziskave, štiri na oddelku za podporo in poslovni razvoj ter dva tehnika. Skupno število zaposlenih v letu 2019 je torej 58, od tega jih je 40 na oddelku za raziskave, 15 na oddelku za podporo in poslovni razvoj, trije pa so tehniki.

V InnoRenew CoE je 51 odstotkov vseh zaposlenih tujcev, ki prihajajo iz 15 držav – Belgije, Brazilije, Bosne in Hercegovine, Češke, Finske, Francije, Hrvaške, Indije, Italije, Madžarske, Norveške, Poljske, Švedske, Tajske in ZDA.

Table 2: InnoRenew CoE employees

Preglednica 2: Zaposleni v InnoRenew CoE v letu 2019

	InnoRenew CoE Employee	Citizenship	Position
	Science		
1	Assoc. Prof. Andreja Kutnar, PhD	Slovenia	Director
2	Assist. Prof. Michael Burnard, PhD	United States of America/Slovenia	Deputy Director; Research Group Leader, Human Health in the Built Environment
3	Assoc. Prof. Miklós Krész, PhD	Hungary	Research Group Leader, Information and Computer Technologies
4	Assist. Prof. Anna Sandak, PhD	Poland	Research Group Leader, Wood Modification
5	Assist. Prof. Iztok Šušteršič, PhD	Slovenia	Research Group Leader, Sustainable Building with Renewable Materials
6	Assoc. Prof. David B. DeVallance, PhD	United States of America	Research Group Leader, Renewable Materials Composites
7	Kelly Peeters, PhD	Belgium/Slovenia	Researcher
8	Črtomir Tavzes, PhD	Slovenia	Researcher
9	Assist. Prof. Matthew Schwarzkopf, PhD	United States of America	Researcher
10	Assist. Prof. Jakub Sandak, PhD	Poland	Researcher
11	Assist. Prof. Václav Sebera, PhD	Czech Republic	Researcher
12	Balázs Dávid, PhD	Hungary	Researcher
13	Erwin M. Schau, PhD	Norway	Researcher
14	Prof. Michael Mrissa, PhD	France	Researcher
15	Veerapandian Ponnuchamy, PhD	India	Researcher
16	Jonathan Woody, PhD	United States of America	Researcher
17	Laetitia Marrot, PhD	France	Researcher
18	Igor Gavrić, PhD	Slovenia	Researcher
19	Darjan Smajla, PhD	Slovenia/Croatia	Researcher
20	Rok Prislan, PhD	Slovenia	Researcher
21	Ana Slavec, PhD	Slovenia	Researcher and Consulting Statistician
22	Prof. Nejc Šarabon, PhD	Slovenia	Senior Research Advisor

	InnoRenew CoE Employee	Citizenship	Position
	Science		
23	Prof. Diego De Leo, PhD	Italy	Senior Research Advisor
24	Barbara Rovere	Slovenia	Assistant Researcher and Project Management
25	Eva Prelovšek Niemelä	Slovenia	Assistant Researcher and Architect
26	Dean Lipovac	Slovenia	Assistant Researcher
27	Aleksandar Tošič	Slovenia	Assistant Researcher
28	Amy Simmons	United States of America	Assistant Researcher
29	Marica Mikuljan	Slovenia	Assistant Researcher
30	Aleš Oven	Slovenia	Assistant Researcher
31	Aarne Niemelä	Finland	Assistant Researcher and Architect
32	Nastja Podrekar	Slovenia	Assistant Researcher
33	László Hajdu	Hungary	Assistant Researcher
34	Jaka Gašper Pečnik	Slovenia	Assistant Researcher
35	Vesna Starman	Slovenia	Assistant Researcher
36	Tatiana Abaurre Alencar Gavric	Brazil	Assistant Researcher
37	Faksawat Poohphajai	Sweden/Thailand	Assistant Researcher
38	Nežka Sajinčič	Slovenia	Assistant Researcher
39	Tim Mavrič	Slovenia	Assistant Researcher
40	Jure Žitnik	Slovenia	Assistant Researcher
	Support and business development		
1	Lea Primožič	Slovenia	Public Relations
2	Nataša Škorja Djikanović	Slovenia	Accountant
3	Tamara Turk	Slovenia	Accountant
4	Tine Šukljan	Slovenia	Information Technology Specialist (Head of Unit)
5	Alijana Batič	Slovenia	Project Management, Administrative Support
6	Jerneja Svanjak	Slovenia	Human Resources
7	Julija Uršič	Slovenia	Language Editor
8	Elizabeth Ann Dickinson	United States of America	Project Manager and Language Editor
9	Manca Drobne	Slovenia	Project Manager
10	Kim Turk Mehes	Slovenia	Living Lab InnoRenew Manager and Policy Consultant
11	Roberto Biloslavo, PhD	Slovenia	Head of Technology Transfer Unit
12	Gertrud Fábián	Hungary	Information Technology Administrator
13	Patricija Bembič	Slovenia	Accountant
14	Barbara Kotrle	Slovenia	Administrative Support
15	Zijada Adembegović Hujdurović	Bosnia	Human Resources
	Technicians		
1	Rudi Grahek	Slovenia	Technician, Mechanical Engineering
2	Josip Dijanić	Slovenia	Technician
3	Edit Földvári-Nagy	Hungary	Laboratory Technician

In addition, 11 InnoRenew CoE employees are enrolled in doctoral programs. All are supported by the institute in their academic and early research careers.

V letu 2019 je bilo 11 zaposlenih v InnoRenew CoE vpisanih tudi na doktorski študij. Prizadevamo si namreč podpirati naše zaposlene na začetku njihovih akademskih in raziskovalnih poti.

Table 3: InnoRenew CoE employees enrolled in doctoral programs

Preglednica 3: Doktorski študentje v InnoRenew CoE v letu 2019

	InnoRenew CoE Employee	Faculty	Institution
1	Barbara Rovere	Faculty of Management	University of Primorska
2	Dean Lipovac	Faculty of Management	University of Primorska
3	Aleksandar Tošić	Faculty of Mathematics, Natural Sciences and Information Technologies	University of Primorska
4	Nastja Podrekar	Faculty of Health Sciences	University of Primorska
5	László Hajdu	Institute of Informatics	University of Szeged
6	Jaka Pečnik	Faculty of Management	University of Primorska
7	Vesna Starman	Faculty of Education	University of Primorska
8	Faksawat Poohphajai	School of Chemical Engineering	Aalto University
9	Nežka Sajinčič	Faculty of Education	University of Primorska
10	Tim Mavrič	Faculty of Humanities	University of Primorska
11	Jure Žitnik	Faculty of Health Sciences	University of Primorska

InnoRenew CoE employees. Image: InnoRenew CoE
Zaposleni v InnoRenew CoE. Foto: InnoRenew CoE

Awards
Nagrade

In 2019, InnoRenew CoE employees received awards recognizing the quality and importance of their work.

Dean Lipovac, InnoRenew CoE assistant researcher, was an awardee of the 2019 Ron Cockcroft Award given by the International Research Group on Wood Protection (IRG). The award enabled him to attend the IRG50 conference in Québec City, Canada. While at the conference, he received the Gareth Williams Scholarship Award for best presentation among doctoral students. It was given in recognition of his presentation regarding the impact of wood protection techniques and natural weathering on aesthetics and preferences.

Dr. Michael Burnard, InnoRenew CoE deputy director and assistant professor at the University of Primorska, was among the awardees recognized for highest pedagogy, research and professional service by the University of Primorska's rector. Dr. Burnard was granted the Honor Role for excellent scientific achievement.

Dr. Andreja Kutnar, InnoRenew CoE director, was nominated for Slovenian of the Year 2019. Readers of the magazine *Zarja* vote yearly for this award that honors Slovenian women who made an important mark for Slovenia, whether through their work or personality. Dr. Kutnar was one of 11 successful women selected from more than 100 nominations, hailing from fields including sports, culture, medicine, entrepreneurship, journalism and science.

Dr. Ana Slavec, InnoRenew CoE researcher and consulting statistician, became the Research Data Alliance (RDA) Ambassador for Engineering/Renewable Materials. She applied to the RDA ambassador program and won a grant to engage with data practitioners and organizations working in the domain of renewable materials and products.

V letu 2019 so nekateri zaposleni v InnoRenew CoE prejeli nagrade, ki dokazujejo kakovost in pomembnost njihovega dela.

Dean Lipovac, raziskovalni asistent v InnoRenew CoE, je bil med prejemniki nagrade Ron Cockcroft Award 2019, ki mu je omogočila udeležbo na mednarodni raziskovalni konferenci o zaščiti lesa – The International Research Group on Wood Protection (IRG) – v Kanadi. Na konferenci je nastopil s predstavitvijo o tem, kako tehnike za zaščito lesa in naravno staranje učinkujejo na dojemanje estetike lesa. Zanjo je prejel nagrado Gareth Williams Scholarship Award za najboljšo predstavitev med doktorskimi študenti.

Dr. Michael Burnard, namestnik direktorice in vodja raziskovalne skupine Človekovo zdravje v grajenem okolju v InnoRenew CoE ter docent na Fakulteti za matematiko, naravoslovje in informacijske tehnologije, je bil med prejemniki najvišjih priznanj pedagoškim, raziskovalnim in strokovnim zaposlenim ter študentom na univerzi, ki jih je podelil rektor Univerze na Primorskem. Prejel je svečano listino Univerze na Primorskem za dosežke na področju znanstvenega dela.

Dr. Andreja Kutnar, direktorica InnoRenew CoE, je bila nominirana za naslov Slovenka leta 2019. Bralci revije *Zarja* vsako leto izglasujejo Slovenko leta, ki je s svojim delom in osebnostjo posebej zaznamovala Slovenijo. Za leto 2019 so uredniki revije med več kot 100 predlogi izbrali 11 kandidatk, uspešnih žensk z različnih področij – športa, kulture, medicine, podjetništva, novinarstva, znanosti.

Dr. Ana Slavec, raziskovalka in svetovalka za statistiko v InnoRenew CoE, je postala ambasadorka za tehniko – obnovljive materiale v Združenju za raziskovalne podatke (Research Data Alliance – RDA). Prijavila se je na razpis v okviru njihovega ambasadorskega programa in pridobila dotacijo, namenjeno sodelovanju s strokovnjaki na področju podatkov in z organizacijami, ki delujejo na področju obnovljivih materialov in izdelkov.

Dr. Lone Ross Gobakken, Avtar Sidhu and Dean Lipovac at the Gareth Williams Scholarship Awards ceremony. Image: Anna Sandak / Dr. Lone Ross Gobakken, Avtar Sidhu in Dean Lipovac na slovesnosti ob podelitvi nagrad Gareth Williams Scholarship Awards. Foto: Anna Sandak

Dr. Andreja Kutnar nominated for Slovenian of the Year 2019. Image: Revija Zarja / Dr. Andreja Kutnar, nominirana za Slovenko leta 2019. Foto: Revija Zarja

Dr. Michael Burnard received the Honor Role for excellent scientific achievement. Image: Alen Ježovnik
Dr. Michael Burnard je prejel svečano listino Univerze na Primorskem za dosežke na področju znanstvenega dela. Foto: Alen Ježovnik

Research projects

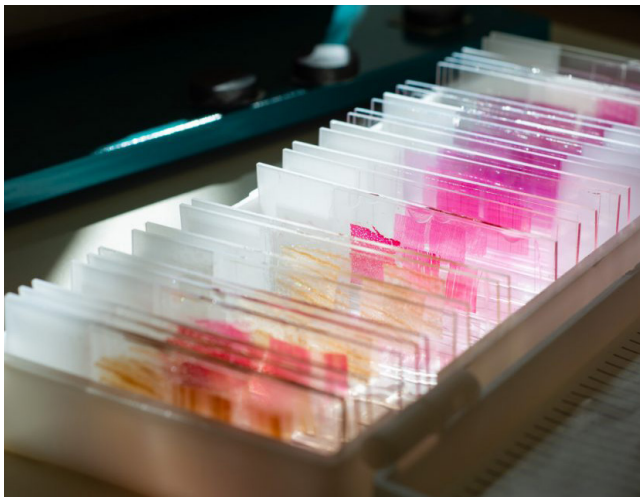
Raziskovalni projekti

In 2019, InnoRenew CoE executed 23 projects (11 under InnoRenew CoE's coordination), of which 16 are financed by the Slovenian Research Agency: five basic projects, one postdoctoral project and 10 bilateral projects (four with the USA, two with Austria, two with Bosnia and Herzegovina, one with Serbia and one with Italy).

In addition, InnoRenew CoE has one project financed by the European Regional Development Fund and Republic of Slovenia Ministry of Education, Science and Sport; one project funded by the European Cohesion Fund, Republic of Slovenia Ministry of Education, Science and Sport and Public Scholarship, Development, Disability and Maintenance Fund of the Republic of Slovenia (completed June 2019); one project funded by the Erasmus+ program; two projects funded by the ForestValue program and three projects funded by the Horizon 2020 program.

V letu 2019 je InnoRenew CoE izvajal 23 projektov (11 kot koordinator), od tega jih 16 financira Javna agencija za raziskovalno dejavnost (ARRS), in sicer pet temeljnih projektov, eden podoktorski projekt in 10 bilateralnih projektov (štiri z ZDA, sva z Avstrijo, dva z Bosno in Hercegovino, eden s Srbijo in eden z Italijo).

Projekte InnoRenew CoE poleg tega financirajo: enega Evropski sklad za regionalni razvoj in Ministrstvo za izobraževanje, znanost in šport RS (MIZŠ), enega Evropski kohezijski sklad, MIZŠ in Javni štipendijski, razvojni, invalidski in preživninski sklad RS (zaključil se je junija 2019), enega program Erasmus+, dva program ForestValue in tri program Obzorje 2020.



Research at the InnoRenew CoE. Image: InnoRenew CoE
Raziskave v InnoRenew CoE. Foto: InnoRenew CoE

Table 4: InnoRenew CoE projects in 2019

Preglednica 4: Projekti InnoRenew CoE, ki so se izvajali v letu 2019

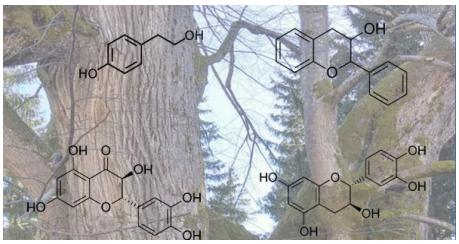
	InnoRenew CoE Research Project	Project Leader	Period	Project Financing	Project Partners
1	Protection of bronze monuments in the changing environment, J7-9404	Ropret Polonca/ Jakub Sandak (for InnoRenew CoE)	1.7.2018 - 30.6.2021	Slovenian Research Agency (ARRS)	Institute for the protection of Cultural Heritage of Slovenia (coordinator), the InnoRenew CoE, Slovenian National Building and Civil Engineering Institute
2	Traversability of vertex-transitive graphs, J1-9110	Klavdija Kutnar/ Kresz Miklos (for InnoRenew CoE)	1.7.2018 - 30.6.2021	Slovenian Research Agency (ARRS)	University of Primorska, Andrej Marušič Insitute (coordinator), the InnoRenew CoE, University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies, University of Ljubljana, Faculty of Education
3	Selective extraction of high value molecules from forest products processing residues in the speciality chemicals sector, J4-1767 ©	Andreja Kutnar	1.7.2019 - 30.6.2022	Slovenian Research Agency (ARRS)	InnoRenew CoE (coordinator), Institut "Jožef Stefan", ARHEL projektiranje in inženiring d.o.o., University of Ljubljana, Faculty of Pharmacy, University of Primorska, Andrej Marušič Institute
4	Using questionnaires to measure attitudes and behaviours of buildings users, Z5–1879 (B)	Ana Slavec	1.7.2019 - 30.6.2021	Slovenian Research Agency (ARRS)	InnoRenew CoE
5	Optimisation for sustainable supply chains, N1-0093	Andreja Kutnar (for InnoRenew CoE) and Tamas Kis (for Institute for Computer Science and Control, Hungarian Academy of Sciences)	1.4.2019 - 31.03.2022	Slovenian Research Agency (ARRS)	InnoRenew CoE, Institute for Computer Science and Control, Hungarian Academy of Sciences
6	LDesign of multifunctional polysaccharide composite nanoparticles for deacidification, strength improvement and prevention of microbial attack of historical cellulose-based artifacts, J4-1764 ©	Mohan Tamilselvan (University of Maribor) / Matthew John Schwarzkopf (for InnoRenew CoE)	1.7.2019 - 30.6.2022	Slovenian Research Agency (ARRS)	University of Maribor, Faculty of mechanical engineering (coordinator), National and University Library, Institute for the Protection of Cultural Heritage of Slovenia, the InnoRenew CoE
7	Spectroscopy and multivariate data analysis for quality control of modified wood, BI-IT/18-20-007	Anna Malgorzata Sandak	1.9.2018 - 31.8.2020	Slovenian Research Agency (ARRS)	InnoRenew CoE, University of Modena and Reggio Emilia
8	The use of chemical wood modifications to protect wood against wood-borers in the marine Environment, BI-RS/18-19-002	Andreja Kutnar	27.6.2018 - 31.12.2019	Slovenian Research Agency (ARRS)	InnoRenew CoE, University of Belgrade, Faculty of Forestry
9	Synchrotron-based analysis of densified wood impregnated with curing resins, BI-US/18-20-014	Matthew John Schwarzkopf	1.10.2018 – 30.9.2020	Slovenian Research Agency (ARRS)	InnoRenew CoE, Forest Products Laboratory
10	Perception and performance assessment in bio-based architecture, BI-US/18-20-054	Anna Sandak Malgorzata	1.10.2018 – 30.9.2020	Slovenian Research Agency (ARRS)	InnoRenew CoE, Oregon State University, Department of Wood Science and Engineering
11	Perceptions of, competencies, capacities and possibilities for the implementation of environment- and human health-friendly living environments, BI/BA-19-20-021	Andreja Kutnar	15.1.2019 - 31.12.2020	Slovenian Research Agency (ARRS)	InnoRenew CoE, Public scientific research institution Institute for Protection and Ecology of the Rep. of Srpska
12	Strategies for improvement of energy efficiency of residential buildings through retrofitting, BI/ BA-19-20-030	Anna Malgorzata Sandak	15.1.2019 - 31.12.2020	Slovenian Research Agency (ARRS)	InnoRenew CoE, Faculty of Architecture, Civil Engineering and Geodesy, University of Banja Luka
13	Seismic analysis of tall timber buildings, BI-US/19-21-014	Iztok Šušteršič	1.10.2019 - 30.9.2021	Slovenian Research Agency (ARRS)	InnoRenew CoE, Colorado School of Mines, Golden, CO

	InnoRenew CoE Research Project	Project Leader	Period	Project Financing	Project Partners
14	Wood chip technology for livestock heavy use areas to improve water quality, BI-US/19-21-114	David Brian DeVallance	1.10.2019 - 30.9.2021	Slovenian Research Agency (ARRS)	InnoRenew CoE, University of Vermont Extension Center for Sustainable Agriculture, Burlington, Vermont
15	Innovation activities of Austrian and Slovenian companies in the wood-value chain, BI-AT/20-21-006	Ana Slavec	1. 1. 2020 – 31.12.2021	Slovenian Research Agency (ARRS)	InnoRenew CoE, Institute for System Sciences, Innovation and Sustainability Research, University of Graz
16	Optimization problems of the residual biomass value chain, BI-AT/20-21-014	Jakub Michal Sandak	1. 1. 2020 – 31.12.2021	Slovenian Research Agency (ARRS)	InnoRenew CoE, Vienna University of Technology
17	WOOD AND WOOD PRODUCTS OVER A LIFETIME - WOOLF, OP20.03520	M SORA, trgovina in proizvodnja, d.d. Principal Consortium partner/ Iztok Šušteršič (for InnoRenew CoE)	1.12.2018 – 31.11.2021	European Union – European Regional Development Fund (ERDF) - Call for proposals "to support Research and development projects (TRL 3-6) & Ministry of Education, Science and Sport	M SORA, trgovina in proizvodnja d.d. (principal consortium partner), Gozdarski inštitut Slovenije, the InnoRenew CoE, L-TEK elektronika d.o.o., REM montaža in kleparstvo d.o.o., Univerza v Ljubljani, Biotehniška fakulteta, XLAB razvoj programske opreme in svetovanje d.o.o., Zavod za gradbeništvo Slovenije
18	Development of novel functional proteins and bioactive ingredients from rapeseed, olive, tomato and citrus fruit side streams for applications in food, cosmetics, pet food and adhesives', Grant No.: 792050	TEKNOLOGISK INSTITUT (DTI) (Denmark)/ Matthew John Schwarzkopf (for InnoRenew CoE)	1.5.2018 – 30.4.2021	EU, Horizon 2020 - Bio-based Industries JU	TEKNOLOGISK INSTITUT DTI (coordinator), Bangor University, the InnoRenew CoE, Gea Group, Anecoop Sociedad Cooperativa, Tailorzyme Aps, Agro Business Park As, Emmelev As, Vertech Group, Franka Marzi, Chimar Hellas Ae, Innovarum, Olivar De Segura, Mars Gmbh, Natac Biotech Sl, Tate & Lyle
19	Underpinning the vital role of the forest-based sector in the Circular Bio-Economy - WoodCircus, Grant No.: 820892	Teknologian tutkimuskeskus VTT Oy (Finland)/ Burnard Michael David (for InnoRenew CoE)	1.11.2018 – 31.10.2021	EU, Horizon 2020	Teknologian tutkimuskeskus VTT Oy (coordinator), Institut Technologique FCBA, the InnoRenew CoE, Nova-Institut GMBH, Fundacion Tecnalia Research & Innovation, Consorzio Del Mobile SCPA, LUONNONVARAKESKUS, INNOVAWOOD ASBL, Sahateollisuus ry, AlfaNatura d.o.o., Asociación Baskegur, Consorzio Nazionale per la raccolta, il recupero e il riciclaggio degli imballaggi di legno – Rilegno, EGOIN SA, Forest-Based Sector Technology Platform, European Panel Federation AISBL, Veolia France, SAIB
20	Pilots for Healthy and Active Ageing – PHArA-ON	Scuola superiore di studi universitari e di perfezionamento Sant'Anna (Italy)/ Michael David Burnard (for InnoRenew CoE)	1. 12. 2019 – 31. 11. 2023	EU, Horizon 2020	SANT'ANNA (Coordinator), HEWLETT PACKARD ITALIANA SRL, FONDZIONE CASA SOLLIEVO DELLA SOFFERENZA, UP Umana Persone, CO-ROBOTICS SRL, ORTHOKEY ITALIA SRL, ASOCIACION EMPRESARIAL DE INVESTIGACION CENTRO TECNOLOGICO DEL MUEBLEY LA MADERA DE LA REGION DE MURCIA, SERVICIO MURCIANO DE SALUD , UNIVERSIDAD POLITECNICA DE CARTAGENA, MY ENERGIA ONER SL, CONSEJERIA DE IGUALDAD Y POLITICAS SOCIALES DE LA JUNTA DE ANDALUCIA , UNIVERSIDAD DE JAEN, FUNDACION AGEING SOCIAL LAB, ROBOTNIK AUTOMATION SLL, INDRA SISTEMAS SA, IRMANDADE DA SANTA CASA DA MISERICORDIA DA AMADORA IPSS, UNIVERSIDADE DA BEIRA INTERIOR, CARITAS DIOCESANA DE COIMBRA , UNIVERSIDADE DE COIMBRA, Maastricht Instruments, ROESSINGH RESEARCH AND DEVELOPMENT BV, STICHTING NATIONAAL OUDERENFONDS, UNIVERSITEIT TWENTE, AdSysCo B.V., INNORENEW COE, NACIONALNI INSTITUT ZA JAVNO ZDRAVJE, DOM UPOKOJENCEV IZOLA - Casa del pensionato Isola, ERICSSON NIKOLA TESLA D.D., ASCORA GMBH, STELAR SECURITY TECHNOLOGY LAW RESEARCH UG, GIP AUTONOM'LAB, INFORMATION CATALYST FOR ENTERPRISE LTD, AGE PLATFORM EUROPE, Minds & Sparks GmbH, Domalys SAS, Glintt - Healthcare Solutions, S.A, SENLAB, DRUZBA ZA INFORMACIJSKO TEHNOLOGIJO, DOO, SENTAB ESTONIA OU, TALLINNA TEHNIKAULIKOOL, DIN DEUTSCHES INSTITUT FUER NORMUNG E.V., UNINFO - Associazione di Normazione Informatica

	InnoRenew CoE Research Project	Project Leader	Period	Project Financing	Project Partners
21	Boosting a novel and innovative tRAining approaCh of Key Enabling Technologies (BRACKET), 2018-1-HR01-KA202-047493	Institut za razvoj i međunarodne odnose, Croatia/ Burnard Michael David (for InnoRenew CoE)	1.11.2018 – 30. 4. 2021	EU, Erasmus+	Institut Za Razvoj I Medunarodne Odnose (coordinator), Danmar Computers sp z o.o., Technologiko Ekpedeftiko Idryma Thessalias, Asociacion Empresarial De Investigacion Centro, Tecnologico Del Muebley La Madera De La Region De Murcia, Biedriba Eurofortis, Ljudska univerza Rogaška Slatina, the Innorenew CoE
22	Dynamic Response of Tall Timber Buildings under Service Load - DynaTTB	RISE/ Research Institute of Sweden/ Iztok Šušteršič (for InnoRenew CoE)	1.3.2019 – 28.2.2022	European Union – ForestValue Research Programme & Ministry of Education, Science and Sport	RISE Research Institute of Sweden (coordinator), NTNU Norwegian University of Science and Technology, University of Exeter, University of Ljubljana, the Innorenew CoE, Centre Scientifique et Technique du Bâtiment, Linnaeus University, Moelven Töreboda AB, SWECO Norge AS avd Lillehammer, Smith and Wallwork Engineers Ltd, GALEO, Eiffage Immobilier, ARBONIS
23	CLICK DESIGN delivering fingertip knowledge to enable service life performance specification of wood	BRE (UK)/Jakub Sandak (for InnoRenew CoE)	1.3.2019 – 28. 2. 2022	European Union – ForestValue Research Programme & Ministry of Education, Science and Sport	BRE Building Research Establishment (coordinator), University of Goettingen, Lund University, VTT Technical Research Centre of Finland, the Innorenew CoE, Institute Technological FCBA, Norwegian Institute of Bioeconomy Research NIBIO, Research Institute for the Biology of Insect (IRBI), FPInnovations, and the company Hygiène Office
	COMPLETED				
24	Development of an application for harvesting timber 2.0, 11081-28/2018	University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies (UP FAMNIT)/for InnoRenew CoE Aleksandar Tošić	1.3.2019 – 30.6. 2019	European Union – European Cohesion Fund & Ministry of Education, Science and Sport & Public Scholarship, Development, Disability and Maintenence Fund of the Republic of Slovenia	University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies (principal consortium partner), M SORA, trgovina in proizvodnja d.d., the InnoRenew CoE, University of Ljubljana, Faculty of Maritime Studies and Transport, University of Primorska, Faculty of Management

Selective extraction of high value molecules from forest products processing residues in the speciality chemicals sector

PROJECT LEADER: Andreja Kutnar, PhD
PERIOD: 01.07.2019 – 30.06.2022
FINANCED: Slovenian Research Agency (ARRS)
PROJECT COORDINATOR: InnoRenew CoE (Slovenia)
PARTNERS: Institut "Jožef Stefan" (Slovenia); ARHEL projektiranje in inženiring d.o.o. (Slovenia); University of Ljubljana, Faculty of Pharmacy (Slovenia); University of Primorska, Andrej Marušič Institute (Slovenia)



Project summary: Forest-based industries, especially pulp and paper industries, produce huge quantities of bark during primary processing activities. In 2017 alone, the European pulp and paper industry used close to 149 million cubic meters of wood. Bark reduces the quality of wood products and is removed and (mainly) burned for energy production. The wet debarking process used for bark removal produces toxic debarking water as a by-product. For each cubic meter of wood, up to 2000 litres of water is used for debarking. The dry weight of the removed bark contains 20-40 percent of lipophilic and hydrophilic extractives, which, due to their toxicity, must be treated in a costly process.

However, these industrial stream residues contain bioactive compounds with a wide range of potential high-value applications in the human healthcare and functional food sectors. Of these compounds, polyphenols are present in large amounts and are of commercial interest. Many polyphenols are shown to have antioxidative activity and free-radical scavenging capacity as well as use in research programs for coronary heart disease prevention, anticancer activity, and anti–HIV functions. These biochemicals are also a potential source of numerous product innovations and can act as alternatives to oil-based chemicals. Finding methods to remove large amounts of these extractives is of great environmental importance and presents an economic opportunity.

This project will develop a methodology for accessing these valuable polyphenols from wet and dry debarking processes, thus adding value to toxic waste materials. The project has the potential to grow and be used at an industrial or commercial level. It will develop, with the use of functionalised magnetic particles, a sustainable and repeatable process for the collection of polyphenols from residue streams followed by a monolith-based separation. To more fully understand the influence of key processing parameters on polyphenol extraction efficiency and accuracy in targeting specific types, a comparison study and modelling (chemometrics combined with in-line spectroscopic analysis) will be made by extracting polyphenols under various conditions. Life cycle analysis and life cycle costing will assess environmental and economic viability of the developed process to determine if there is a benefit to extracting polyphenols from wet or dry debarking residues versus using a conventional method of treating polluted debarking water and burning dry materials.

Project results have the potential to greatly benefit Slovene and European (through IPR management) forest-based industries currently using wet and dry debarking processes and handling the associated waste.

Using questionnaires to measure attitudes and behaviours of buildings users

PROJECT LEADER: Ana Slavec, PhD
PERIOD: 01.07.2019 – 30.06.2021
FINANCED: Slovenian Research Agency (ARRS)
PROJECT COORDINATOR: InnoRenew CoE (Slovenia)

Project summary: This project will study the use of survey questionnaires to collect data on attitudes and behaviours of building users, particularly those behaviours related to sustainability issues and energy consumption. Survey questionnaires are the prevailing data collection method to measure user satisfaction with buildings; however, validity and reliability of current instruments is not known. Designing survey questionnaires is a complex task, and specific knowledge is needed to write effective and understandable survey questions to assure a high level of statistical quality for collected data.

The research objective is to identify existing measurement instruments used by architects and building researchers to collect and understand the needs of building users in the design process and post-occupancy evaluations, assess

Selektivna ekstrakcija molekul z visoko vrednostjo za sektor specialnih kemikalij iz ostankov predelave lesa

VODJA PROJEKTA: dr. Andreja Kutnar
TRAJANJE: 1. 7. 2019 – 30. 06. 2022
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
KOORDINATOR PROJEKTA: InnoRenew CoE
PARTNERJI: Institut »Jožef Stefan« (Slovenija); Univerza na Primorskem, Inštitut Andrej Marušič (Slovenija); ARHEL, projektiranje in inženiring, d. o. o. (Slovenija); Univerza v Ljubljani, Fakulteta za farmacijo (Slovenija)

Opis projekta: Gozdno-lesni sektor, zlasti industrija celuloze in papirja, pri primarni predelavi lesa proizvaja velike količine lubja. Samo v letu 2017 je evropska industrija celuloze in papirja porabila skoraj 149 milijonov kubičnih metrov lesa. Lubje zmanjšuje kakovost lesnih izdelkov in se zato odstranjuje ter v glavnem uporablja za proizvodnjo energije z izgorevanjem. V industriji celuloze in papirja se za odstranjevanje lubja uporablja postopek mokrega lupljenja, katerega stranski proizvod je okolju in zdravju škodljiva voda. Pri predelavi vsakega kubičnega metra lesa se za odstranjevanje lubja porabi do 2 m3 vode. 20–40 % suhe mase odstranjenega lubja so lipofilni in hidrofilni ekstrakti, ki jih je zaradi njihove toksičnosti treba obdelati z dragim posebnim postopkom.

Toda ti industrijski ostanki vsebujejo bioaktivne spojine, ki so lahko primerne za številne uporabe z visoko vrednostjo na področjih človekovega zdravja in funkcionalne prehrane. Med temi spojinami so v velikih količinah prisotni polifenoli, ki so tržno zelo zanimivi. Pri mnogih polifenolih je potrjeno antioksidativno učinkovanje, sposobnost uničevanja prostih radikalov. Polifenoli se uporabljajo v raziskovalnih programih za preprečevanje koronarne bolezni srca, raka in delovanja virusa HIV. Te biokemikalije so tudi potencialni vir za številne inovacije proizvodov in so lahko alternativa na nafti temelječim kemikalijam. Iskanje metod za odstranjevanje velikih količin teh ekstraktov ima velik pomen za okolje, ob tem pa predstavlja gospodarsko priložnost.

Pri tem projektu bomo razvili metodologijo za dostop do teh polifenolov z visoko vrednostjo pri mokrih in suhih procesih odstranjevanja lubja in s tem dodali vrednost toksičnim odpadnim materialom. Projekt vključuje možnosti za nadaljnji razvoj in uporabo tako v industrijske kot komercialne namene. Razvili bomo trajnosten in ponovljiv postopek z uporabo funkcionaliziranih magnetnih delcev za zbiranje polifenolov iz ostankov, ki mu bo sledilo njihovo ločevanje na monolitnih nosilcih. Da bi bolje razumeli vpliv ključnih parametrov obdelave na učinkovitost in natančnost ekstrakcije polifenolov pri ciljanju na specifične tipe, bomo z ekstrakcijo polifenolov pod različnimi pogoji izdelali primerjalno študijo in modeliranje (kemometrija v kombinaciji s sočasno spektroskopsko analizo – in-line spectroscopic analysis). Z analizo življenjskega cikla (LCA) in izračunom stroškov življenjskega cikla (LCC) bomo ocenili okoljsko in ekonomsko upravičenost razvitega postopka, da bi ugotovili, ali je v primerjavi s konvencionalno metodo obdelave onesnažene vode in sežiganjem suhih materialov smiselno ekstrahirati polifenole iz mokrih ali suhih ostankov odstranjevanja lubja.

Rezultati tega projekta lahko (s pomočjo upravljanja pravic intelektualne lastnine) zelo koristijo slovenskim in evropskim industrijam gozdno-lesnega sektorja, ki uporabljajo mokre in suhe procese odstranjevanja lubja in z njimi povezane ostanke.

Uporaba vprašalnikov za merjenje stališč in vedenj uporabnikov stavb

VODJA PROJEKTA: dr. Ana Slavec
TRAJANJE: 1. 7. 2019 – 30. 06. 2021
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
KOORDINATOR PROJEKTA: InnoRenew CoE (Slovenija)

Opis projekta: Namen projekta je proučevanje rabe anketnih vprašalnikov za zbiranje podatkov o stališčih in vedenju uporabnikov stavb, zlasti tistih, ki se nanašajo na vprašanja trajnostnosti in porabe energije. Anketni vprašalniki so prevladujoča metoda zbiranja podatkov za merjenje zadovoljstva uporabnikov s stavbami, vendar veljavnost in zanesljivost trenutnih instrumentov ni znana. Oblikovanje anketnih vprašalnikov je zapletena naloga in zahteva posebno znanje za pisanje učinkovitih in razumljivih anketnih vprašanj, da se zagotovi visoka raven statistične kakovosti zbranih podatkov.

Cilj raziskave je opredelitev obstoječih merilnih instrumentov, ki jih uporabljajo arhitekti in gradbeni raziskovalci za zbiranje in razumevanje potreb uporabnikov stavb v procesu načrtovanja ter pri vrednotenju po zasedenosti, ocena

validity and comprehensibility of existing instruments, then design and assess improved survey questionnaires.

In the project's first phase, a literature review of relevant works that use surveys or other social science research methods to study building users will be conducted, a collection survey question examples will be compiled, and focus groups with architects and building researchers will be held. In the second phase, survey questions will be selected for evaluation with quantitative and qualitative questionnaire pre-testing methods. Based on analysis of the results, an improved survey questionnaire will be developed. In the third phase, the improved instrument will be applied to two case studies and further assessments of the validity will be made based on respondent debriefing.

Solutions for the building sector will be developed based on project results in the form of guidelines to measure building occupant behaviour with higher validity. With improvements in validity and reliability of the measurement, researchers and practitioners in the field will be able to collect more accurate data to inform building design, energy performance planning, energy use models, and energy sustainability rating systems.

InnoRenew CoE project activities: This is a postdoctoral research project and the InnoRenew CoE is the only partner; therefore, project activities will include leading and managing the project, review of literature and methods, evaluation and analysis of questionnaires and their application, and dissemination activities.

Optimisation for sustainable supply chains

PROJECT LEADER: Andreja Kutnar, PhD (InnoRenew CoE) / Tamas Kis, PhD (Institute for Computer Science and Control, Hungarian Academy of Sciences)
PERIOD: 01.04.2019 – 31.03.2022
FINANCED: Slovenian Research Agency (ARRS)
PARTNERS: InnoRenew CoE (Slovenia) and Institute for Computer Science and Control, Hungarian Academy of Sciences (Hungary)

Project summary: The main goal of this research is the optimisation of supply chains considering environmental impact and energy costs. Special attention is given to the field of reverse logistics, where raw materials partly come from recycled sources. New planning models and algorithms are to be developed as the result of this research, and a Collaborative Supply Chain will also be designed for platforms that mainly exist in scientific fields and have not been applied in the industry yet.

InnoRenew CoE project activities: InnoRenew CoE will analyse and specify related industrial problems, identify constraints and parameters, define the decision support framework, and monitor developed methods. For this last activity, InnoRenew CoE researchers will develop a demonstration and simulation environment to evaluate the models and the methods.

Design of multifunctional polysaccharide composite nanoparticles for deacidification, strength improvement and prevention of microbial attack of historical cellulose-based artifacts

PROJECT LEADER: Mohan Tamilselvan, PhD (University of Maribor) / Matthew John Schwarzkopf, PhD (InnoRenew CoE)
PERIOD: 01.07.2019 – 30.06.2022
FINANCED: Slovenian Research Agency (ARRS)
PROJECT COORDINATOR: University of Maribor, Faculty of Mechanical Engineering (Slovenia)
PARTNERS: National and University Library (Slovenia); Institute for the Protection of Cultural Heritage of Slovenia (Slovenia); InnoRenew CoE (Slovenia)

Project summary: Slovenian and European history written on acidic archival materials, dating from 1830 onward, is falling apart. Many unique texts that witnessed historical events, such as the Second World War, are being irreversibly lost due to material destruction. Current conservation measures capable of stopping this substantial loss of information are not free of drawbacks, which include bleeding of original stamps, uneven distribution of

veljavnosti in razumljivost obstoječih instrumentov, nato pa oblikovanje in ocenjevanje izboljšanih vprašalnikov. V prvi fazi projekt vključuje pregled literature ustreznih del, ki uporabljajo ankete ali druge družboslovne metode za proučevanje uporabnikov stavb, zbiranje primerov anketnih vprašanj ter izvedbo fokusnih skupin z arhitekti in raziskovalci gradnje. V drugi fazi bomo izbrali anketna vprašanja za vrednotenje s kvantitativnimi in kvalitativnimi metodami predtestiranja. Na podlagi analize rezultatov bomo razvili izboljšan vprašalnik. V tretji fazi bomo izboljšan instrument uporabili v dveh študijah primera, nadaljnje ocene veljavnosti pa bodo temeljile na poročanju anketirancev.

Na podlagi rezultatov projekta bomo za gradbeni sektor razvili rešitve v obliki smernic o tem, kako bolj veljavno meriti obnašanje uporabnikov stavb. Z izboljšanjem veljavnosti in zanesljivosti meritev bodo raziskovalci in strokovnjaki na tem področju lahko zbrali natančnejše podatke za informacijsko podporo pri načrtovanju stavb, za načrtovanje energetske učinkovitosti, za modele energetske porabe in za sisteme ocenjevanja energetske trajnostnosti.

Glavne dejavnosti InnoRenew CoE pri projektu: Gre za podoktorski projekt in InnoRenew CoE je edini partner. Naše dejavnosti bodo obsegale celoten raziskovalni postopek – od vodenja in upravljanja projekta, pregleda literature in metod, evalvacije in analize vprašalnikov ter njihove aplikacije do diseminacijskih aktivnosti.

Optimizacija trajnostnih oskrbovalnih verig

VODJA PROJEKTA: dr. Andreja Kutnar (za InnoRenew CoE) / dr. Tamas Kis
TRAJANJE: 1. 4. 2019 – 31. 3. 2022
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
PARTNERJA: InnoRenew CoE (Slovenija); Institute for Computer Science and Control, Hungarian Academy of Sciences (Madžarska)

Opis projekta: Primarni cilj raziskave je optimizacija oskrbovalnih verig s poudarkom na okoljskih vplivih in stroških energije. Posebna pozornost je namenjena področju obratne logistike, kjer surovine za proizvodnjo deloma pridobimo s pomočjo recikliranja.

V sklopu raziskave bodo razviti novi modeli in algoritmi. Vzpostavljena bo nova oskrbovalna veriga, ki vključuje delitev neizkoriščenih virov za platforme, ki primarno obstajajo samo v znanstvenih krogih in še niso bili implementirani v praksi in gospodarstvu.

Glavne dejavnosti InnoRenew CoE pri projektu: Naše glavne dejavnosti bodo analiziranje in specificiranje s tem povezanih industrijskih problemov, opredelitev omejitev in parametrov ter opredelitev okvira za podporo odločanju. Poleg tega bomo spremljali izdelane metode. V ta namen bodo raziskovalci v InnoRenew CoE razvili predstavitveno in simulacijsko okolje. Ovrednotili bomo modele in metode s pomočjo demonstracijskega in simulacijskega okolja.

Razvoj multifunkcionalnih polisaharidnih kompozitnih nanodelcev za razkislinjenje, izboljšanje trdnosti in preprečevanje mikrobiološkega napada zgodovinskih artefaktov na osnovi celuloze

VODJA PROJEKTA: dr. Mohan Tamilselvan (Univerza v Mariboru) / dr. Matthew John Schwarzkopf (za InnoRenew CoE)
TRAJANJE: 1. 7. 2019 – 30. 06. 2022
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
KOORDINATOR PROJEKTA: Univerza v Mariboru, Fakulteta za strojništvo (Slovenija)
PARTNERJI: Narodna in univerzitetna knjižnica (Slovenija); Javni zavod Republike Slovenije za varstvo kulturne dediščine (Slovenija); InnoRenew CoE (Slovenija)

Opis projekta: Slovenska in evropska zgodovina, ki je od leta 1830 naprej napisana na kisli arhivski material, počasi razpada. Mnoga unikatna besedila, ki izpričujejo zgodovinske dogodke, kot je npr. druga svetovna vojna, se zaradi propadanja materiala nepovratno izgubljajo. Konservacijski ukrepi, ki so trenutno na voljo za preprečevanje te znatne izgube informacij, imajo mnoge slabosti, kot so npr. bledenje originalnih žigov, neenakomerna porazdelitev materiala

deacidifying material, low mechanical strength and lack of build up for an adequate alkaline reserve against further paper degradation. Therefore, it is necessary to establish a new deacidification method that can be applied to either single paper sheets or bound cellulose items (e.g., books) from Slovenian libraries and archives without any preselection.

Project DeacidCellulose aims to preserve archive materials by using the latest developments in cellulose chemistry and nanotechnology to combat acidity, deterioration of mechanical properties and microbial degradation. DeacidCellulose will develop new paper deacidification routes that combine the best currently available concepts with knowledge of volatile organic solvent reactions and nanotechnology. A nonaqueous solvent process will combine deacidifying, flame-retardant and antimicrobial substances, stabilizers and strengthening agents in one treatment to be applied to cellulose-based artefacts by an effortless dip-coating method. The knowledge gained in DeacidCellulose will overcome current gaps in the Slovenian book preservation field and substantially strengthen the position of the Slovenian archival community.

InnoRenew CoE project activities: InnoRenew CoE will offer support for deacidification of paper-based archival materials definition and needed characterization methods as well as antibacterial and antifungal evaluation of papers. InnoRenew CoE will test paper in ways (mechanical properties, durability, chemical characteristics, etc.) that are crucial to evaluate efficacy of the treatment and further optimize process conditions.

Perceptions of, competencies, capacities and possibilities for the implementation of environment- and human health-friendly living environments

PROJECT LEADER: Andreja Kutnar, PhD
PERIOD: 15.01.2019 – 31.12.2020
FINANCED: Slovenian Research Agency (ARRS)
PARTNERS: InnoRenew CoE (Slovenia) and Institute for Protection and Ecology of the Republic of Srpska (Bosnia and Herzegovina)

Project summary: All over the world, especially in south-east Europe, there is a clear lack of energy efficient buildings. This is not only detrimental from an economic perspective (40 percent of the total energy use and 30 percent of energy-related greenhouse gas emissions), but human health and well-being suffer when the built living environment is suboptimal as well. By using life cycle assessment (LCA), it has been shown that not only the energy in the use phase of a building is important, but that material extraction, transformation, construction, and ultimately demolition, reuse, and recycling also plays a large role. Environment- and human health-friendly living environments may be simply and efficiently constructed from wood (solid wood, engineered wood products, prefabricated construction, etc.) and other natural and renewable materials. Optimally, design and construction procedures would take into account the Restorative Environmental and Ergonomic Design (REED) paradigm principles. Both Slovenia and Bosnia and Herzegovina (BiH) possess capacities in research, education, training, and economy/industry to produce such buildings and built environments. However, the discrepancy between the possible capacities and market size, and relatively low number of good practice examples, is glaring. Investors are faced with significant difficulties in securing energy efficient buildings. There is a limited market offer addressing the challenge of sustainable construction and building impact due to the construction sector's structural problems, such as limited capacity for innovation and networking. The InnoRenew CoE is eager to develop connections to south-east European research organisations and industry. This project will not only strengthen these connections but will build a stronger network of researchers and industry between the two countries. The expected impacts are: a better understanding of society and the market in both countries; better awareness of the population, industry, and policymakers of climate-related issues and the need to decrease energy and material use; ultimately, improved health and well-being of both countries' residents; and better competitive position of the wood-based construction sector.

InnoRenew CoE project activities: InnoRenew CoE will ascertain the perception of different parts of society towards such construction (compare with the EU), identify and study good practice examples, opportunities, and barriers in Slovenia (compare with BiH), map research providers, education and training actors, public bodies, and industry (knowledge, competences, capacities), and propose a system for the identification of synergies and the exploitation of opportunities (research or commercial).

za razkisanje, nizka mehanska trdnost in premajhna zaloga primernih alkalnih snovi proti nadaljnji degradaciji papirja. Treba bi bilo torej zagotoviti novo metodo razkisanja, ki bi jo lahko brez predhodne selekcije uporabili bodisi za posamezne liste papirja ali za vezane celulozne izdelke (npr. knjige) v slovenskih knjižnicah in arhivih.

Z izsledki projekta DeacidCellulose želimo na podlagi izsledkov najnovejšega razvoja v kemiji celuloze in nanotehnologije prispevati k ohranjanju arhivskih materialov, k boju proti njegovi kislosti, poslabšanju mehanskih lastnosti in mikrobni razgradnji. Projekt bo razvil nove poti za razkisanje papirja s kombinacijo trenutno najboljših razpoložljivih konceptov z znanjem o reakcijah hlapnih organskih topil in nanotehnologijo. Nevodni proces topil združuje razkisanje, zaviralce gorenja in protimikrobne spojine, stabilizatorje ter sredstva za ojačitev v enem samem postopku obdelave in bo apliciran na artefakte na osnovi celuloze z enostavnim postopkom prevlečenja s potopitvijo (angl. dip-coating). Pridobljeno znanje v okviru projekta DeacidCellulose bo odpravilo trenutno obstoječo vrzel na področju slovenskega konserviranja knjig in bo bistveno okrepilo položaj vključene slovenske arhivske skupnosti.

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE bo nudil podporo tako pri opredelitvi parametrov, ki so potrebni za razkisanje papirnatih arhivskih materialov in pri metodah za karakterizacijo, kot pri oceni protibakterijskih in protiglivnih lastnosti vzorcev papirja. Poleg tega bo skrbel za testiranje papirja (mehanske lastnosti, vzdržljivost, kemijske lastnosti itd.), ki je ključno za oceno učinkovitosti postopka obdelave in s tem nadaljnjo optimizacijo pogojev procesa.

Percepcije o, veščine, zmožnosti in možnosti za udejanjanje okolju in človekovem zdravju prijaznih bivalnih okolij

VODJA PROJEKTA: dr. Andreja Kutnar
TRAJANJE: 15. 1. 2019 – 31. 12. 2020
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
PARTNERJA: InnoRenew CoE (Slovenija) in Javni znanstveni raziskovalni inštitut Institut za zaštitu i ekologiju Republike Srpske (Bosna in Hercegovina)

Opis projekta: Po vsem svetu, tudi v Evropi in še posebej v jugovzhodni Evropi, se soočamo s pomanjkanjem energijsko učinkovitih stavb. To ni slabo le z ekonomskega vidika (40 % skupne porabe energije in 30 % s pridobivanjem energije povezanih toplogrednih plinov), temveč tudi z vidika zdravja in dobrega počutja ljudi. Z rabo metode analize življenjskega cikla (LCA) je bilo dokazano, da z okoljskega vidika ni pomembna le tekoča poraba energije v stavbi, temveč tudi način pridobivanja gradbenega materiala, predelava, gradnja in na koncu postopek rušenja, ponovna raba in recikliranje uporabljenih materialov. Okolju in ljudem prijazna bivanjska okolja najenostavneje in stroškovno najučinkoviteje ustvarjamo z gradnjo v lesu (masivni les, izdelki iz lesa, montažna gradnja itd.) in v drugih naravnih in obnovljivih materialih. Optimalno bi bilo, če bi postopki oblikovanja in gradnje sledili načelom paradigme restorativnega okoljskega in ergonomskega oblikovanja (ang. Restorative Environmental and Ergonomic Design – REED). Tako Slovenija kot Bosna in Hercegovina (BiH) imata na področju raziskav, izobraževanja, usposabljanja in gospodarstva zmogljivosti, ki omogočajo gradnjo tovrstnih zgradb in bivalnih okolij. A med potencialom in velikostjo trga ter majhnim številom dobrih praks je očitna razlika. Investitorji so soočeni s precejšnjimi izzivi pri zagotavljanju energijsko učinkovitih stavb zaradi omejene ponudbe na trgu, povezane z izzivi trajnostne gradnje in učinka stavb; omejeni ponudbi botrujejo strukturne težave v gradbeništvu, kot je na primer majhna sposobnost inoviranja in mreženja. InnoRenew CoE si želi razviti povezave z raziskovalno sfero in gospodarstvom v jugovzhodni Evropi. Ta predlog sodelovanja bo okrepil obstoječe povezave in omogočil razvoj močnejše mreže raziskovalcev in gospodarstva obeh držav ter doprinesel h gospodarski rasti, ki upošteva omejitve narave. Pričakovani učinki so: boljše razumevanje družbe in trga med akademiki in gospodarstvom; širjenje in poglabljanje zavedanja o tematiki, povezani s podnebnimi spremembami in potrebo po zmanjšani rabi energije in materialov, med prebivalci, gospodarstvom in javnimi odločevalci; izboljšano zdravje in dobro počutje prebivalcev v obeh državah ter večja konkurenčnost gozdno-lesnega sektorja.

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE bo v okviru projekta preveril odnos različnih družbenih okolij do take gradnje (v primerjavi z EU). Poleg tega bo poiskal in proučil slovenske primere dobrih praks, priložnosti in ovir ter rezultate primerjal s stanjem v BiH. Pripravil bo pregled ustanov, ki se ukvarjajo z raziskavami, izobraževanjem in usposabljanjem na tem področju, pa tudi pregled javne uprave in izvajalskih podjetij (znanje, veščine, kapacitete) s tega področja in predlagal sistem za prepoznavanje sinergij in izkoriščanje priložnosti (raziskovalnih ali ekonomskih).

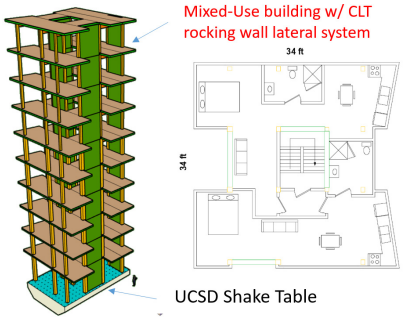
Strategies for improvement of energy efficiency of residential buildings through retrofitting

PROJECT LEADER: Anna Sandak, PhD
PERIOD: 15.01.2019 — 31.12.2020
FINANCED: Slovenian Research Agency (ARRS)
PARTNERS: InnoRenew CoE (Slovenia) and University of Banja Luka, Faculty of Architecture, Civil Engineering and Geodesy (Bosnia and Herzegovina)

Project summary: Around 35 percent of the EU's buildings are over 50-years old. The restoration of residential buildings has a significant share (65 percent) of the renovation market. It is estimated that deep renovation of the existing stock, together with nearly zero energy buildings, can save 80 percent of the final energy use for space heating by 2050. Therefore, one of the challenges for the near future, and a significant opportunity for scientific development and innovation, is upgrading the existing building stock in an effective and sustainable way. Retrofit is now one of the main trends in Europe's construction industry. Recovering buildings through renovation, rather than demolition, is a common practice but also a vital concern from a sustainability perspective. Energy efficiency of buildings can be achieved through the following strategies: bioclimatic architecture (e.g., shape and orientation of the building, solar protections, passive solar systems), high performing building envelope (e.g., thorough insulation, high performing glazing and windows, air-sealed construction, avoidance of thermal bridges), and high-performance ventilation (e.g., mechanical insulation, heat recovery). The E-REFIT project will identify current trends in reducing the energy demand of residential buildings. The recent tendencies in improving energy efficiency in Slovenia and Bosnia and Herzegovina will be compared and evaluated. The collection of best practices for retrofitting of residential buildings, with the aim to improve energy performance, will be disseminated to a broad audience. It is expected that the E-REFIT project will combine the decision making and design tools dedicated to architects, designers, building manufacturers, technology suppliers, and facilities managers with the overall goal to improve the energetic performance of residential building through retrofitting. Consequently, the E-REFIT project will trigger renovation and promote new collaborative innovation strategies and practices between the involved countries.

InnoRenew CoE project activities: InnoRenew CoE will be responsible for providing best practice examples regarding retrofitting of residential buildings in Slovenia, identifying potential barriers in the implementation of recommended retrofitting solutions, and developing strategies for knowledge transfer between participating countries.

Seismic analysis of tall timber buildings



PROJECT LEADER: Iztok Šušteršič, PhD
PERIOD: 01.10.2019 – 30.09.2021
FINANCED: Slovenian Research Agency (ARRS)
PARTNERS: InnoRenew CoE (Slovenia) and Colorado School of Mines, Golden, Colorado (USA)

Project summary: In the future, a shift to sustainable construction techniques with renewable materials is of crucial essence. Engineered timber, championing the sustainability potential of all construction materials, has evolved to a stage that enables the construction of not only family housing but also taller buildings, commonly built from concrete or steel. Unfortunately, designing taller buildings made from timber is more demanding than of their concrete counterparts. Since such tall timber structures have only been present for the last decade, there is also less practical experience with their real-life behaviour, especially on seismically active areas. Hence, it is crucial to investigate and analyse taller timber buildings and their dynamic performance for different load cases – earthquake being the most important one, followed by wind – and provide appropriate guidelines for their design. The project proposal strives for bringing together the experience of Slovenian and American researchers that already have a track record in the field of tall timber buildings, broaden it further based on combined knowledge and new experimental findings and, finally, derive a dynamic design methodology suitable for application in engineering design codes. The American side will perform the biggest shaking table test ever, a 10-story CLT building, surpassing the current record of three stories. Testing will be performed on the NHERI shaking table at UCSD. The experiment is remarkable by itself as it will be a one-to-one scale test of a real structure exposed to intense ground motions. This project will enable enriching the exclusive experimental testing and numerical modelling with the expertise and experience of Slovenian researchers. Gathered data will be used to re-calibrate finite element models and enable

Strategije za izboljšanje energijske učinkovitosti s temeljito prenovo stanovanjskih stavb

VODJA PROJEKTA: dr. Anna Malgorzata Sandak
TRAJANJE: 15. 1. 2019 — 31. 12. 2020
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
PARTNERJA: InnoRenew CoE (Slovenija) in Fakulteta za arhitekturo, gradbeništvo in geodezijo Univerze v Banjaluki (Bosna in Hercegovina)

Opis projekta: Približno 35 % gradenj v EU je starejših od 50 let. Pri obnovah predstavljajo stanovanjske zgradbe pomemben delež, kar 65 % vseh obnovitvenih del. Ocenjujejo, da bi s temeljito prenovo obstoječih in gradnjo novih stavb v načinu ničenergijske gradnje do leta 2050 lahko privarčevali 80 % končne energije za ogrevanje prostorov. Zato je učinkovita in trajnostna nadgradnja obstoječega stavbnega fonda kratkoročno eden od velikih izzivov za znanstveni razvoj in inovacije. Temeljita prenova je trenutno eden največjih trendov v evropskem gradbeništvu, saj je oživitev zgradb z obnovo in ne rušenjem postala ne le splošna praksa, ampak tudi pomembna perspektiva trajnostnosti. Energijsko učinkovitost zgradb lahko dosežemo z več strategijami, kot so bioklimatska arhitektura (npr. oblika in orientacija zgradbe, zaščita pred sončenjem, pasivni solarni sistemi), visokozmogljivi stavbni ovoji (npr. temeljita izolacija, visokokakovostna okna in zasteklitve, zrakotesna gradnja, izogibanje toplotnim mostičkom) in visokozmogljivi sistemi prezračevanja (npr. mehanska izolacija, izraba povratne toplote). V projektu E-REFIT bomo opredelili sodobne trende pri zmanjševanju potrebe po energiji v stanovanjskih zgradbah. Primerjali in ocenjevali bomo prizadevanja za izboljšanje energijske učinkovitosti v Sloveniji in Bosni in Hercegovini. Ugotovitve o dobrih praksah pri temeljiti prenovi stanovanjskih zgradb, ki vključuje izboljšanje energijske učinkovitosti, bomo razširjali množičnemu občinstvu. Pričakujemo, da bomo v projektu E-REFIT združili orodja za oblikovanje in sprejemanje odločitev, kar bo namenjeno arhitektom, oblikovalcem, gradbenikom, dobaviteljem tehnoloških rešitev in upravljavcem zgradb, s končnim ciljem, da se s temeljito prenovo izboljša poraba energije v stanovanjskih zgradbah. S projektom E-REFIT bomo zato spodbudili obnove v obeh sodelujočih državah in promovirali nove skupne strategije in prakse sodelovanja pri inovacijah.

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE bo pri projektu zadolžen za zagotavljanje primerov najboljše prakse glede naknadnega opremljanja stanovanjskih stavb v Sloveniji, za ugotavljanje morebitnih ovir pri izvajanju priporočenih rešitev za obnovo in za razvoj strategij za prenos znanja med sodelujočima državama.

Potresna analiza visokih lesenih zgradb

VODJA PROJEKTA: dr. Iztok Šušteršič
TRAJANJE: 1. 10. 2019 – 30. 9. 2021
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
PARTNERJA: InnoRenew CoE (Slovenija) in Colorado School of Mines, Golden, CO (ZDA)

Opis projekta: V prihodnosti je nujno, da se gradbeništvo preusmeri v trajnostne tehnologije gradnje z obnovljivimi materiali. Gradbeni les, ki ima med gradbenimi materiali največji trajnostni potencial, je dosegel stopnjo razvoja, ki nam omogoča gradnjo ne le družinskih hiš, pač pa tudi višjih zgradb, ki so bile doslej navadno grajene iz betona ali jekla. Na žalost je projektiranje višjih lesenih zgradb zahtevnejše kot pa tistih iz betona. Ker tako visoke lesene zgradbe obstajajo šele zadnje desetletje, imamo glede njihovega obnašanja manj izkušenj, kar še posebej velja na potresnih območjih. Zato je nujno proučiti in analizirati visoke lesene zgradbe in njihovo dinamično obnašanje pri različnih obtežnih primerih – predvsem potresa, pa tudi vetra – ter podati primerne smernice za njihovo projektiranje. Predlagani projekt si zato prizadeva združiti izkušnje slovenskih in ameriških raziskovalcev, ki so v preteklosti že izkazovali rezultate s področja visokih lesenih konstrukcij, jih v nadaljevanju razširiti na podlagi povezovanja znanja in novih eksperimentalnih rezultatov ter na koncu podati metodologijo za dinamični odziv lesenih zgradb, ki bo primerna za uporabo v inženirskih standardih. Ameriška stran bo izvedla doslej največji test na potresni mizi, kjer bodo preizkusili 10-etažno zgradbo iz CLT-plošč in tako za 3 etaže presegli trenutni rekord. Testiranje bo opravljeno na potresni mizi NHERI univerze UCSD. Eksperiment je izjemen že sam po sebi, saj bodo preizkusili zgradbo v merilu ena proti ena, ki bo izpostavljena močnemu tresenju tal. Projekt bo omogočil obogatitev ekskluzivnega eksperimentalnega testiranja in numeričnega modeliranja z znanjem in izkušnjami slovenskih raziskovalcev. Zbrani podatki bodo uporabljeni za rekalibracijo modelov končnih elementov in bodo omogočili boljše razumevanje metod

better evaluation of building design methods with state-of-the-art data. Expected outcomes include guidelines for seismic design of tall timber buildings, modification of wind design guidelines and at least two SCI-indexed paper publications. New knowledge gained in this cooperation will lead to further development of research needed to better understand dynamic design methodology of tall timber buildings. Furthermore, this project will strengthen the relationship between institutions and contribute to societal objectives to enhance excellence and efficiency in research and innovation.

InnoRenew CoE project activities: InnoRenew CoE will model the structure to be tested using commercial software. InnoRenew CoE researchers will try to make as good as possible blind prediction based on the tested structure and then use experimental results to recalibrate the model and improve knowledge on specific dynamic parameters.

Wood chip technology for livestock heavy use areas to improve water quality

PROJECT LEADER: David Brian DeVallance, PhD
PERIOD: 01.10.2019 – 30.09.2021
FINANCED: Slovenian Research Agency (ARRS)
PARTNERS: InnoRenew CoE (Slovenia) and University of Vermont Extension Center for Sustainable Agriculture, Burlington, Vermont (USA)

Project summary: Woody biomass, in the form of wood chips and biochar, are renewable materials that have been used historically in drainage and soil amendment applications. Both wood chips and biochar perform different functions in terms of soil quality, pollutant reduction, and drainage. Excess nutrients, specifically nitrogen and phosphorus, have been, and continue to be, a major contributor to water pollution and water quality degradation within surface waters throughout the world. Specifically, confined winter feeding of livestock is a major source of nutrient and sediment loss to surface waters due to increase in manure runoff from these concentrated areas. Sustainable and affordable approaches are needed that effectively control manure nutrients and reduce the environmental burden of manure waste runoff. To alleviate these concerns in small farming operations, wood chips have the potential for use in livestock heavy-use areas (HUAs). HUA structures prevent damage to pasture, reduce dirty water volumes, limit nutrient and sediment pollution to surface waters, and improve animal comfort. Installations typically consist of a shallow excavated area filled with a base layer of stone aggregate, containing a network of perforated drainage pipes, overlain by a thick layer of woodchips. Nutrient-laden water is either absorbed by the woodchips or percolates downward and enters the drainage system, where it is directed away for treatment or containment. Our prior research has indicated that wood characteristics are key for optimal HUAs performance.

Additionally, our research has indicated that thermochemically modified wood chips have potential for use in within HUAs to improve water quality. Wood chip HUAs have been of increased interest in the northeastern region of the United States and are demonstrating positive effects on the environment. However, HUAs are not common in Slovenia, but their use has the potential to improve farming practices and help with rural development. Objectives of the project are to advance wood chip use and investigate new classes of thermochemically modified wood chips that have the potential to improve farming practices within Slovenia and the United States. The project will assist in rural development by providing first-hand knowledge of low-cost solutions for manure waste management at large and small family farms within Slovenia. Promotion of HUAs within Slovenia will provide a market for sawmill by-products and help create a new value chain for using wood chips to improve water quality.

InnoRenew CoE project activities: InnoRenew CoE will determine necessary wood chip properties for use in livestock HUAs through evaluation of existing HUAs in the United States. InnoRenew CoE will provide knowledge related to use of thermochemically modified wood chips and their potential for use in HUAs. Researchers from the InnoRenew CoE will also assist in promoting HUA technology within Slovenia by presenting the technology to potential end-users and sawmills.

projektiranja, podkrepljenih z najsodobnejšimi dognanji.

Glavne dejavnosti InnoRenew CoE pri projektu: Raziskovalci iz InnoRenew CoE se bodo ukvarjali z modeliranjem testnega objekta, pri čemer bodo uporabili komercialno programsko opremo. Skušali bodo narediti čim boljšo slepo napoved obnašanja testne konstrukcije, rezultate eksperimentov pa bodo kasneje lahko uporabili za rekalibracijo modela in izboljšanje znanja o specifičnih dinamičnih parametrih.

Tehnologija lesnih sekancev na področju živinoreje z visoko rabo za izboljšanje kakovosti

VODJA PROJEKTA: dr. David Brian DeVallance
TRAJANJE: 1. 10. 2019 – 30. 9. 2021
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
PARTNERJA: InnoRenew CoE (Slovenija) in University of Vermont Extension Center for Sustainable Agriculture, Burlington, Vermont (ZDA)

Opis projekta: Lesna biomasa v obliki sekancev in biooglja je obnovljiv material, ki ga že uporabljamo pri izboljševanju drenaže in lastnosti prsti. Tako lesni sekanci kot biooglje opravljajo različne funkcije, povezane s kakovostjo zemlje, zmanjšanjem škodljivih snovi in drenažo. Presežek hranil, predvsem dušika in fosforja, pomembno prispeva k onesnaževanju vod in degradaciji kakovosti vode v površinskih vodah po vsem svetu. Zimsko krmljenje živine v zaprtih obratih je glavni vir odtekanja hranil in sedimentov v površinske vode. Potrebni so trajnostni in cenovno dostopni pristopi, ki učinkovito nadzorujejo hranila v gnoju v obdobju zimskega hranjenja, hkrati zagotavljajo zdravo in udobno okolje za živali, ob tem pa zmanjšujejo obremenjevanje okolja z odpadki iz gnoja. Za ublažitev teh težav pri majhnih kmetovalcih uporabljamo površine z visoko vsebnostjo lesnih sekancev (PVVS). Uporaba takih površin preprečuje poškodbe pašnikov, zmanjšuje količino umazane vode, omejuje onesnaževanje površinskih vod s hranili in sedimenti ter povečuje udobje živali. Vzpostavitev običajno vključuje plitek izkop, napolnjen s plastjo kamenega agregata, ki vsebuje mrežo perforiranih drenažnih cevi, pokritih z debelo plastjo sekancev. S hranili obremenjena voda se absorbira v sekance ali pronica globlje in vstopi v kanalizacijo, kjer je preusmerjena proti obdelavi ali zajetju. Dosedanje raziskave so pokazale, da so značilnosti vode ključ do najboljšega obnašanja PVVS. Poleg tega so naše raziskave pokazale, da imajo toplotno modificirani sekanci za PVVS zmožnost, da izboljšajo kakovost vode. Zanimanje za sekance oziroma PVVS se v severovzhodni regiji Združenih držav Amerike povečuje, saj kaže številne pozitivne učinke na okolje. V Sloveniji to področje še ni raziskano, ima pa velik potencial za izboljšanje kmetovanja in razvoj podeželja. Cilj projekta je povečati rabo sekancev in raziskati nove razrede toplotno modificiranih sekancev, ki lahko izboljšajo kmetovanje v Sloveniji in v Združenih državah Amerike. Projekt bo pomagal pri razvoju podeželja z zagotavljanjem znanja o stroškovno ugodnih rešitvah za ravnanje z gnojili za velike in male družinske kmetije v Sloveniji. S promocijo PVVS v Sloveniji bo nastal trg stranskih proizvodov žagarskih obratov, kar bo doprineslo tudi k nastanku nove vrednostne verige uporabe sekancev za izboljšanje kakovosti vode.

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE bo z vrednotenjem obstoječih PVVS v Združenih državah Amerike določil potrebne lastnosti lesnih sekancev za uporabo v živinoreji. Poleg tega bo InnoRenew CoE zagotavljal znanje glede uporabe termo-kemično modificiranih lesnih sekancev in njihovega potenciala za uporabo v PVVS. Raziskovalci InnoRenew CoE bodo pomagali tudi pri promociji tehnologije PVVS v Sloveniji s predstavitvijo tehnologije potencialnim končnim uporabnikom in žagarskim obratom.

Dynamic Response of Tall Timber Buildings under Service Load (DynaTTB)

PROJECT LEADER: RISE Research Institutes of Sweden / Iztok Šušteršič, PhD (for InnoRenew CoE)
PERIOD: 01.03.2019 – 01.03.2022
FINANCED: European Union ForestValue Research Programme and the Republic of Slovenia Ministry of Education, Science and Sport
PROJECT COORDINATOR: RISE Research Institute of Sweden (Sweden)
PARTNERS: Norwegian University of Science and Technology (Norway); University of Exeter (UK); University of Ljubljana (Slovenia); InnoRenew CoE (Slovenia); Centre Scientifique et Technique du Bâtiment (France); Linnaeus University (Sweden); Moelven Töreboda AB (Sweden); SWECO Norge AS avd Lillehammer (Norway); Smith and Wallwork Engineers Ltd (UK); GALEO (Spain); Eiffage Immobilier (France); ARBONIS (France)

Project summary: Wooden houses represent one of the most efficient ways of storing CO2 in the built environment. They address principal environmental challenges and contribute to a circular economy in the building industry. High-rise building offers high cost and space efficiency. However, we need to better understand vibrations caused by the wind, which contribute to size, shape, and mass design in order to minimize effects on physical well-being. Therefore, we need to obtain information about oscillation time and damping of high-rise buildings that are susceptible to resonance with wind vibration. Despite the increased popularity for high-rise building, currently only some information and little knowledge is known regarding damping, mass distribution, and rigidity in this kind of building. Dynamic properties of the building are mostly dependent on damping in wooden connections as well as in non-structural elements. To solve this problem, we are designing new, more detailed experimental research, with calibrated numerical models, that will enable us to better describe and predict high-rise building behaviour under wind load. TRL stage is estimated at 3-4. The methodology involves experimental measurements of components of building structures (mainly wood joints) and already constructed buildings. They will serve to verify numerical models based on the finite element method. By using this approach, it will be possible to more accurately evaluate the parameters that are currently given as an estimate and are not consistently scientifically verified. More precise models will enable more reliable planning of the high-rise buildings, which will promote greater use of high-rise wooden buildings as part of urban development, with the possible increase of growth value and market for renewable products in the forest economy.

InnoRenew CoE project activities: InnoRenew CoE will be responsible for analysis of existing experimental results with the focus on damping in CLT connections and performance of additional experiments, 3D models of buildings that will be tested in-situ, coordination of dissemination activities, and development of guidelines for the design of tall timber buildings under wind load.

CLICKdesign delivering fingertip knowledge to enable service life performance specification of wood

PROJECT LEADER: BRE / Jakub Sandak, PhD (for InnoRenew CoE)
PERIOD: 01.03.2019 – 01.03.2022
FINANCED: European Union ForestValue Research Programme and the Republic of Slovenia Ministry of Education, Science and Sport
PARTNERS: BRE (United Kingdom); University of Goettingen (Germany); Lund University (Sweden); VTT Technical Research Centre of Finland (Finland); Innorenew CoE (Slovenia); Institute Technological FCBA (France); NIBIO Norwegian Institute of Bioeconomy Research (Norway); IRBI Research Institute for the Biology of Insect (France); FPInnovations (Canada); and Hygiène Office (France)

Project summary: CLICKdesign will develop a performance-based specification protocol to enable provision of a software tool for architects and specifiers to embed service life performance specification for wood. The expected major breakthrough of CLICKdesign is the development of a performance-based specification protocol for wood in construction and enables provision of a software tool for service life performance specification for planners and architects. This major innovation will expand the reach of wood products to new users beyond the small proportion of specifiers who are xylophiles and 'wood aware', increasing market confidence with users for wood as a reliable product and expand possibility for new product innovations. This supports the forest sector's vision to triple market share for wood products and services in construction by 2030. The CLICKdesign tool will facilitate reaching this goal by combining an easy-to-use tool with pedagogic background information.

Dinamični odziv visokih lesenih zgradb pri uporabni obratovalni obtežbi – DynaTTB

VODILNA INSTITUCIJA: RISE, Research Institute of Sweden / dr. Iztok Šušteršič (za InnoRenew CoE)
TRAJANJE: 1. 3. 2019 – 1. 3. 2022
FINANCIRANJE: Evropska Unija – ForestValue Research Programme in Ministrstvo za izobraževanje, znanost in šport Republike Slovenije
KOORDINATOR PROJEKTA: RISE Research Institute of Sweden (Švedska)
PARTNERJI: Norveška univerza za znanost in tehnologijo (NTNU – Norwegian University of Science and Technology); Univerza v Exetru (University of Exeter) (Združeno kraljestvo Velike Britanije); Univerza v Ljubljani (Slovenija); InnoRenew CoE (Slovenija); Centre Scientifique et Technique du Bâtiment (Francija); Univerza Linnaeus (Linnaeus University) (Švedska); Moelven Töreboda AB (Švedska); SWECO Norge AS avd Lillehammer (Norveška); Smith and Wallwork Engineers Ltd (Združeno kraljestvo Velike Britanije); GALEO (Španija); Eiffage Immobilier (Francija); ARBONIS (Francija)

Opis projekta: Lesene stavbe predstavljajo enega najboljših načinov za skladiščenje ogljika v grajenem okolju. Naslavljajo poglavitne okoljske izzive in prispevajo h krožnemu gospodarstvu v sklopu gradbene industrije. Visoke lesene stavbe obenem ponujajo možnost stroškovno učinkovite izrabe prostora. Ne razumemo pa še dobro vibracij, ki jih v tovrstnih zgradbah povzroča veter in posledično narekuje njihovo načrtovanje v okviru velikosti, oblike in teže, ki minimizirajo neugodno počutje. Potrebujemo več informacij o lastnih nihajnih časih in dušenju visokih zgradb, ki so dovzetne za resonanco z vibracijami vetra. Kljub vse večji priljubljenosti visokih lesenih zgradb je trenutno na voljo le malo informacij in znanja v zvezi z dušenjem, porazdelitvijo mase in togosti pri nihanju tovrstnih konstrukcij. Na dinamične lastnosti pa vplivajo predvsem dušenje v lesenih spojih in nekonstrukcijski elementi.
Rešitev problema načrtujemo z razvojem novih, natančnejših numeričnih modelov, umerjenih z eksperimentalnimi preiskavami, ki bodo omogočali bolj zanesljivo napovedovanje obnašanja visokih lesenih stavb pri obratovalni obtežbi vetra.
Natančnejši modeli bodo omogočili zanesljivejše načrtovanje visokih lesenih stavb, kar bo spodbudilo večjo uporabo visokih lesenih zgradb v okviru urbanega razvoja, z možnostjo, da se povečata tudi vrednost in trg obnovljivih proizvodov gozdnega gospodarstva.

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE bo zadolžen za analizo obstoječih rezultatov, pri čemer se bo osredotočil na dušenje v stikih CLT konstrukcij in izvedbo dodatnih eksperimentov, za izdelavo 3D modelov obstoječih zgradb, ki bodo eksperimentalno preizkušene na terenu, za vodenje delovnega sklopa diseminacije ter za koordinacijo razvoja in priprave smernic za projektiranje visokih lesenih zgradb glede na vetrno obtežbo.

Zagotavljanje »fingertip« znanja, ki omogoča določitev lastnosti lesa v odvisnosti od življenjske dobe – CLICKdesign

VODILNA INSTITUCIJA: BRE / dr. Jakub Sandak (za InnoRenew CoE)
TRAJANJE: 1. 3. 2019 – 1. 3. 2022
FINANCIRANJE: Evropska unija – ForestValue Research Programme in Ministrstvo za izobraževanje, znanost in šport Republike Slovenije
PARTNERJI: BRE – Building Research Establishment (Združeno Kraljestvo Velike Britanije); Univerza v Göttingenu (Nemčija); Univerza v Lundu (Švedska); VTT Technical Research Centre of Finland (Finska); InnoRenew CoE (Slovenija); Institut technologique FCBA (Francija); Norwegian Institute of Bioeconomy Research NIBIO (Norveška); Research Institute for the Biology of Insect (IRBI) (Francija); FPInnovations (Kanada); Hygiène Office (Francija)

Opis projekta: Namen projekta CLICKdesign, ki med seboj povezuje skupino raziskovalcev in industrijo, je razvijanje specifikacijskega protokola, zasnovanega glede na uspešnost rezultatov, ki bo arhitektom in drugim strokovnjakom omogočil programska orodja s specifikacijo delovanja lesa glede na njegovo življenjsko dobo. S tem bo v gradbeništvu specifikacija lesa prvič določena na podlagi lastnosti; danes uporabniki z lastnostmi lesa večinoma niso seznanjeni, kar jim lahko predstavlja težave.
Projekt bo zagotovil znanstveno razumevanje lastnosti lesa v odvisnosti od njegove izpostavitve vremenskim vplivom. Združil bo programsko orodje in različne modele ter podatkovne baze lastnosti, povezanih z razkrojem in integriteto, estetsko funkcijo in odpornostjo na termite. Projekt bo na tem področju prinesel precejšen napredek in bo novo generacijo oblikovalcev t. i. »zdravega lesa« spodbudil k inovativnim rešitvam pri oblikovanju lesa, pri čemer bo naredil pomemben korak k digitalizaciji znanja in specifikacij. Razvoj programskega orodja na pilotni ravni

InnoRenew CoE project activities: InnoRenew CoE will define a numerical quantifier of the aesthetical state of wooden elements exposed to weathering, design a procedure for determination of aesthetical limit states for the customer tolerance to material deterioration, implement weather dose-response modelling approach for simulation of the wooden elements appearance changes along service life, develop an optimization tool for scheduling of cleaning, maintenance, replacement, and integrate simulation of building aesthetical changes with visualization software.

Pilots for Healthy and Active Ageing – PHArA-ON

PROJECT LEADER: Scuola superiore di studi universitari e di perfezionamento Sant'Anna (Italy) / Michael David Burnard, PhD (for InnoRenew CoE)
PERIOD: 1. 12. 2019 – 31. 11. 2023
FINANCED: European Union Horizon 2020
PROJECT COORDINATOR: Scuola superiore di studi universitari e di perfezionamento Sant'Anna (Italy)
PARTNERS: Hewlett Packard Italiana SRL (Italy); Fondazione Casa Sollievo della Sofferenza (Italy); UP Umana Persone (Italy); Co-Robotics S.r.l. (Italy); Orthokey Italia S.r.l. (Italy); Asociacion Empresarial de Investigacion Centro Tecnológico del Mueble y la Madera de la Región De Murcia (Spain); Servicio Murciano de Salud (Spain); Universidad Politécnica de Cartagena (Spain); My Energia Oner, S.l. (Spain); Consejeria De Igualdad y Politicas Sociales de la Junta de Andalucia (Spain); Universidad de Jaén (Spain); Fundación Ageing Social Lab (Spain); Robotnik Automation S.L.L. (Spain); Indra Sistemas, S.A. (Spain); Irmandade da Santa Casa da Misericordia da Amadora IPSS (Portugal); Universidade da Beira Interior (Portugal); Cáritas Diocesana de Coimbra (Portugal); Universidade de Coimbra (Portugal); Maastricht Instruments (Netherlands); Roessingh Research and Development B.V. (Netherlands); Stichting Nationaal Ouderenfonds (Netherlands); Universiteit Twente (Netherlands); AdSysCo B.V. (Netherlands); InnoRenew CoE (Slovenia); Nacionalni inštitut za javno zdravje (Slovenia); Dom upokojencev Izola – Casa del pensionato Isola (Slovenia); Ericsson Nikola Tesla d.d. (Croatia); Ascora GmbH (Germany); Stelar Security Technology Law Research UG (Germany); GIP Autonom'Lab (France); Information Catalyst for Enterprise Ltd. (United Kingdom); AGE Platform Europe (Belgium); Minds & Sparks GmbH (Austria); Domalys SAS (France); Glintt – Healthcare Solutions, S.A. (Portugal); SenLab, družba za informacijsko tehnologijo, d. o. o. (Slovenia); Sentab Estonia OÜ (Estonia); Tallinna Tehnikaülikool (Estonia); DIN – Deutsches Institut für Normung e.V. (Germany); UNINFO – Associazione di Normazione Informatica (Italy)

Project summary: PHArA-ON's overall objective is to make smart and active living a reality for Europe's ageing population. The project aims to accomplish this by creating a set of integrated, highly customizable, and interoperable open platforms with advanced services, devices, and tools, including the Internet of Things, artificial intelligence, robotics, cloud computing, smart wearables, big data, and intelligent analytics. Platform interoperability will be implemented in PHArA-ON ecosystems and platforms as well as other standardised platforms within the domains of health, energy, transport, and smart cities. PHArA-ON will consider relevant standards and contribute to them with the help of the consortium's two standardisation bodies. Data privacy, cybersecurity, interoperability, and openness will be key design principles pursued through requirements generated by PHArA-ON experts. PHArA-ON will be built upon mature, existing, and state-of-the-art open platforms and technologies/tools provided by the partners, which will be customised and implement cloud technologies, artificial intelligence techniques, and traditional algorithms for big data intelligent analytics. A user-centred approach will be followed. PHArA-ON will evolve based on user feedback and results from an MAFEIP framework that will be implemented for impact assessment. Both inputs will be used to find innovative solutions through two open calls: (1) single solutions and (2) solutions to be demonstrated in small-scale pilots. PHArA-ON's integrated platforms will be validated in two stages: (1) pre-validation and (2) large-scale pilots in six pilot sites located in Murcia and Andalusia (Spain), Portugal, The Netherlands, Slovenia, and Italy. A team of partners in each pilot will ensure PHArA-ON's wide applicability and sound development. A set of development tools will be created and made publicly available to simplify customisation and integration. These tools and dissemination of results will spread the generated knowledge to promote development of new solutions similar to PHArA-ON.

InnoRenew CoE project activities: InnoRenew CoE will support the Slovenian demonstration project, advise on technical implementation of a joint platform, and propose design and structural considerations to support ICT

bo sledil odprtokodnemu standardu (IFS, ISC), kar bo omogočilo njegovo aplikacijo v BIM (Building Information Modeling). Nova programska oprema bo industrijo, ki temelji na lesarstvu, usmerila k specifikacijam, ki temeljijo na uspešnosti, in s tem odprla nove poslovne priložnosti. To bo povečalo tržno zaupanje uporabnikov v les kot zanesljiv material in izboljšalo optimizirano delovanje lesa v grajenem okolju.

Glavne dejavnosti InnoRenew CoE pri projektu: Glavne dejavnosti v InnoRenew CoE bodo zajemale določanje numeričnih količnikov estetskega stanja lesenih elementov, izpostavljenih vremenskim vplivom, oblikovanje postopkov za določanje mejnih estetskih stanj kupčeve tolerance glede na poslabšanje materiala, izvedbo modeliranja odzivanja na vremenske vplive – simulacijo sprememb, ki se pojavljajo pri lesu v njegovi življenjski dobi –, razvoj optimizacijskega orodja za načrtovanje čiščenja/vzdrževanja/zamenjave ter povezovanje in simulacijo estetskih sprememb stavbe z BIM.

Pilotne raziskave za zdravo in aktivno staranje – PHArA-ON

VODILNA INSTITUCIJA: Scuola superiore di studi universitari e di perfezionamento Sant'Anna / dr. Michael David Burnard (za InnoRenew CoE)
TRAJANJE: 1. 12. 2019 – 31. 11. 2023
FINANCIRANJE: Obzorje 2020 (EU)
PARTNER IN KOORDINATOR PROJEKTA: Scuola superiore di studi universitari e di perfezionamento Sant'Anna (Italija)
PARTNERJI: Hewlett Packard Italiana s.r.l. (Italija); Fondazione Casa Sollievo della Sofferenza (Italija); UP Umana Persone (Italija); Co-Robotics S.r.l. (Italija); Orthokey Italia S.r.l. (Italija); Asociacion Empresarial de Investigacion Centro Tecnológico del Mueble y la Madera de la Región De Murcia (Španija); Servicio Murciano de Salud (Španija); Universidad Politécnica de Cartagena (Španija); My Energia Oner, S.l. (Španija); Consejeria De Igualdad y Politicas Sociales de la Junta de Andalucia (Španija); Universidad de Jaén (Španija); Fundación Ageing Social Lab (Španija); Robotnik Automation S.L.L. (Španija); Indra Sistemas, S.A. (Španija); Irmandade da Santa Casa da Misericordia da Amadora IPSS (Portugalska); Universidade da Beira Interior (Portugalska); Cáritas Diocesana de Coimbra (Portugalska); Universidade de Coimbra (Portugalska); Maastricht Instruments (Nizozemska); Roessingh Research and Development B.V. (Nizozemska); Stichting Nationaal Ouderenfonds (Nizozemska); Universiteit Twente (Nizozemska); AdSysCo B.V. (Nizozemska); InnoRenew CoE (Slovenija); Nacionalni inštitut za javno zdravje (Slovenija); Dom upokojencev Izola – Casa del pensionato Isola (Slovenija); Ericsson Nikola Tesla d.d. (Hrvaška); Ascora GmbH (Nemčija); Stelar Security Technology Law Research UG (Nemčija); GIP Autonom'Lab (Francija); Information Catalyst for Enterprise Ltd. (UK); AGE Platform EURope (Belgija); Minds & Sparks GmbH (Avstrija); Domalys SAS (Francija); Glintt – Healthcare Solutions, S.A. (Portugalska); SenLab, družba za informacijsko tehnologijo, d. o. o. (Slovenija); Sentab Estonia OÜ (Estonija); Tallinna Tehnikaülikool (Estonija); DIN – Deutsches Institut für Normung e.V. (Nemčija); UNINFO – Associazione di Normazione Informatica (Italija)

Opis projekta: Splošni cilj projekta PHArA-ON je ustvariti resnično pametno in aktivno življenje za starajoče se prebivalstvo Evrope. Gradil bo na integriranih in visoko prilagodljivih ter interoperabilnih odprtih platformah, naprednih storitvah, napravah in orodjih, vključno z internetom stvari (IoT), umetno inteligenco, robotiko, računalništvom v oblaku (cloud computing), pametnimi prenosljivimi elektronskimi napravami, masovnimi podatki in inteligentno analitiko.

Interoperabilnost platforme se bo izvajala v ekosistemih in na platformah PHArA-ON pa tudi na drugih standardiziranih platformah v zdravstvu in na drugih področij (energetika, promet in pametna mesta). PHArA-ON bo upošteval ustrezne standarde in s pomočjo dveh organov za standardizacijo, ki sta del projektnega konzorcija, k njim tudi prispeval. V projektu bodo sledili ključnim zahtevam in načelom, ki so jih zastavili strokovnjaki pri PHArA-ON, kot so varnost podatkov, kibernetska varnost, interoperabilnost in odprtost. PHArA-ON bo gradil na najsodobnejših razvitih obstoječih odprtih platformah in tehnologijah/orodjih, ki so prilagojeni potrebam uporabnikov in jih zagotavljajo partnerji projekta. Ti bodo implementirali »tehnologije v oblaku« (cloud technologies), tehnike umetne inteligence in tradicionalne algoritme za inteligentno analitiko masovnih podatkov. Uporabljal se bo uporabniško usmerjeni pristop. Projekt se bo razvijal skladno s povratnimi informacijami uporabnikov in z rezultati v okviru MAFEIP (Monitoring and Assessment Framework for the EURopean Innovation Partnership on Active and Healthy Ageing), na podlagi česar so bo ocenjevalo učinek. Podatki iz obeh virov se bodo uporabljali pri iskanju inovativnih rešitev – bodisi posameznih rešitev bodisi rešitev, prikazanih v pilotnih raziskavah manjšega obsega.

Integrirane platforme PHArA-ON bodo potrjene v dveh stopnjah, in sicer pri predhodni validaciji in pri obsežnejših pilotnih raziskavah, ki bodo izvedene na šestih različnih pilotnih mestih – v Murcii in Andaluziji (Španija), na Portugalskem, Nizozemskem, v Sloveniji in Italiji. Ekipa partnerjev bo na vsakem mestu skrbela za široko uporabnost in stabilen razvoj projekta. Za poenostavitev prilagajanja in integracije bo na voljo javno dostopna zbirka razvojnih

integrations into the built environment. InnoRenew CoE will lead WP6 – Ecosystem Evolution – to plan, initiate, and operate a grant scheme for third parties that will demonstrate the scalability and adaptability of the PHArA-ON platform by connecting it with new and existing solutions for testing and demonstration. InnoRenew CoE will also provide reporting support for national partners, contribute to pre- and post-analysis of the demonstration system, and support the identification of relevant national and regional initiatives related to policy, workforce training, and higher education programmes as well as participate in project networking and dissemination activities both nationally and internationally.

Development of an application for harvesting timber 2.0

PROJECT LEADER: University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies / Aleksandar Tošić (for InnoRenew CoE)
PERIOD: 01.03.2019 – 30.06.2019
FINANCED: European Union European Cohesion Fund; Republic of Slovenia Ministry of Education, Science and Sport; and Public Scholarship, Development, Disability and Maintenance Fund of the Republic of Slovenia
PRINCIPAL CONSORTIUM PARTNER: University of Primorska, Faculty of Mathematics, Natural Sciences and Information Technologies (Slovenia)
PARTNERS IN CONSORTIUM: M SORA, trgovina in proizvodnja d.d. (Slovenia); InnoRenew CoE (Slovenia); University of Ljubljana, Faculty of Maritime Studies and Transport (Slovenia); University of Primorska, Faculty of Management (Slovenia)

Project summary: In the previous project RecAPPture, in cooperation with M SORA and UP FAMNIT, we developed an application through which the public can offer used wood for collection. The motivation for development was the potential re-use of the wood due to its long lifespan. In practice, this means that after demolishing a wooden beam, for example, it would not be used to generate heat (incineration), but first used, instead, to make wooden windows, then for wooden composites, and lastly for heating (incineration). The potential for re-use of wood is also reflected in the EU's tightening of the disposal of derived timber to landfills, as this is no longer desirable and does not comply with EU regulations and guidelines. Using ReCaPture, M SORA builds a database of locations and an estimated amount of waste wood in Slovenia. The cost of transport between a particular location and company is relatively high, which makes the entire process of producing raw material economically not viable. Visiting multiple locations in one go is an intuitive solution but choosing which location and the order in which locations are visited is very important. The problem that we intend to solve is the logistical optimization of the transport of used timber. In more detail, given the locations and estimated quantities of used timber, we want to find an optimum order of the locations that the transport vehicle needs to visit in order to minimize transport costs while maximizing the amount of transported timber. The costs include salaries, mileage, and carbon dioxide emissions. Finding the optimal path when considering these constraints is a known mathematical problem that can be hard to solve if including capacities of vehicles and waste wood. The goal is to develop a custom computational model that will be integrated into an existing ReCaPture application. It will serve as a decision support system. M SORA will use the system to obtain an optimal plan for the collection of used timber and calculate the expected costs using the adjustable parameters (e.g., the cost of transport per kilometre).

InnoRenew CoE project activities: InnoRenew CoE will develop a mixed integer model for logistic optimization, implement the data conversion interface between the ReCaPture application and the computational model, integrate the computational model into the ReCaPture web application, and create a notification system that will serve to inform M SORA about potential transport opportunities with costs lower than the set limit and complete system testing and system dynamics, depending on the number of collations.

orodij. Ta orodja in rezultati razširjanja/diseminacije bodo služili širjenju pridobljenega znanja za spodbujanje razvoja novih rešitev, podobnih projektu PHArA-ON.

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE bo podpiral slovenski demonstracijski projekt, svetoval pri tehnični izvedbi skupne platforme in predlagal oblikovne in strukturne premisleke, namenjene integraciji IKT v grajeno okolje. InnoRenew CoE bo vodil delovni sklop 6 – Razvoj ekosistema, kjer bo načrtoval, uvajal in izvajal shemo financiranja za tretje stranke. Ta bo pokazala nadgradljivost in prilagodljivost platforme PHArA-ON, tako da se jo bo povezalo z novimi in že obstoječimi rešitvami za testiranje in demonstracijo. InnoRenew CoE bo nacionalnim partnerjem zagotavljal tudi podporo pri poročanju, prispeval k demonstracijskemu sistemu pred analizo in po njej ter podprl določanje ustreznih nacionalnih in regionalnih iniciativ, povezanih s strategijami, usposabljanjem zaposlenih in visokošolskimi programi. Poleg tega bo sodeloval tudi pri mreženju in razširjanju rezultatov tako na nacionalni kot internacionalni ravni.

Razvoj aplikacije za zbiranje odsluženega lesa 2.0

VODJA PROJEKTA: Univerza na Primorskem, Fakulteta za matematiko, naravoslovje in informacijske tehnologije (UP FAMNIT) / Aleksandar Tošič (za InnoRenew CoE)
TRAJANJE: 1. 3. 2019 – 30. 6. 2019
FINANCIRANJE: Evropska unija – Evropski socialni sklad (ESS), Ministrstvo za izobraževanje, znanost in šport RS in Javni štipendijski, razvojni, invalidski in preživninski sklad RS
KOORDINATOR PROJEKTA: Univerza na Primorskem, Fakulteta za matematiko, naravoslovje in informacijske tehnologije (UP FAMNIT) (Slovenija)
PARTNERJI V KONZORCIJU: M SORA, trgovina in proizvodnja, d. d. (Slovenija); InnoRenew CoE (Slovenija); Univerza v Ljubljani, Fakulteta za pomorstvo in promet (UL FPP) (Slovenija); Univerza na Primorskem, Fakulteta za management (UP FM) (Slovenija)

Opis projekta: V predhodnem projektu ReCaPture je InnoRenew CoE v sodelovanju s podjetjem M SORA razvil aplikacijo, s pomočjo katere lahko kdorkoli sporoči, da ima na razpolago odslužen les. Razlog za razvoj aplikacije je bila možnost, da se odsluženi les lahko ponovno uporabi, saj ima dolgo življenjsko dobo. V praksi to na primer pomeni, da se lesen tram po rušitvi objekta namesto za takojšnje pridobivanje toplotne energije (sežig) najprej porabi za lesena okna, nato za lesene kompozite in šele zatem za kurjavo. Potencial ponovne uporabe lesa odraža tudi zaostreno obravnavanje EU glede odlaganja odsluženega lesa na deponije, saj to ni več zaželeno in ni v skladu s predpisi in smernicami EU. M SORA s pomočjo aplikacije ReCaPture gradi podatkovno bazo lokacij in ocenjene količine odpadnega lesa v Sloveniji. Stroški prevoza med posamezno lokacijo in podjetjem so visoki, kar podraži postopek predelave lesa v surovino. To bi lahko rešili z obiski več lokacij v enem obhodu, vendar je pri tem zelo pomemben izbor lokacij. Odločilnega pomena je torej logistična optimizacija transporta odsluženega lesa, čemur se je posvetil tudi projekt. Podrobneje: glede na podane lokacije in predvidene količine odsluženega lesa Razvoj aplikacije za zbiranje odsluženega lesa 2.0 je iskal optimalen obhod lokacij, ki jih mora tovorno vozilo obiskati, da bi minimizirali stroške prevoza in hkrati maksimirali količino prevoženega odsluženega lesa. Stroški vključujejo najem prevoza, prevožene kilometre in izpust ogljikovega dioksida. Iskanje optimalnega obhoda je zahteven matematični problem, če pri tem upoštevamo omejitve količine lesa, ki je na lokacijah, in kapaciteto tovornega vozila. Cilj projekta je bil razviti prilagojen računski model, ki bo integriran v obstoječo aplikacijo ReCaPture in bo služil kot podporni sistem pri odločanju. Uporabnikom bo predlagal optimalen načrt zbiranja odsluženega lesa in izračunal pričakovane stroške z uporabo nastavljivih parametrov (npr. cena prevoza na prevožen kilometer).

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE je pri projektu skrbel za razvijanje mešanega celoštevilskega modela za logistično optimizacijo in implementiranje vmesnika med aplikacijo ReCaPture in računalniškim modelom za pretvorbo podatkov. Poleg tega je bil zadolžen za povezavo računalniškega modela s spletno aplikacijo, razvijanje sistema za obveščanje, ki bo odgovorne seznanjal o možnostih za prevoze, katerih stroški so nižji od postavljene meje, in testiranje sistema in sistemske dinamike v odvisnosti od števila lokacij.

Innovation activities of Austrian and Slovenian companies in the wood-value chain

PROJECT LEADER: Ana Slavec, PhD
PERIOD: 01.01.2020 – 31.12.2021
FINANCED: Slovenian Research Agency (ARRS)
PARTNERS: InnoRenew CoE (Slovenia) and Institute of System Sciences, Innovation and Sustainability Research, University of Graz (Austria)

Project summary: While the Austrian wood sector survived the impact of the economic crisis without major damage, revenues of Slovenian companies in the wood-value chain have been decreasing since 2008 when many large companies were closed. In this bilateral project, we will compare innovation activities of Slovenian and Austrian companies in the sector based on available secondary data. Specifically, we will compare the introduction of product, process, organizational, and marketing innovations; innovation activities and expenditures; public financial support for innovation activities; sources of information and cooperation for product and process innovations; and factors hindering innovation activities. A comparative analysis will enable us to better explain the reasons for lagging of Slovenian companies. Another success factor in the sector is the ownership and management structure of companies. This research question will be addressed by both quantitative and qualitative methods. We will carry out in-depth interviews with selected companies in Austria and Slovenia that will focus on comparison of ownership and management structures. The analysis of selected case studies will help us understand the relationship between these structures and success of the company. One of the research cases will be a study of beekeepers from the innovation adoption and diffusion perspective that will focus on development of future scenarios in the context of economic, environmental, and social challenges. This will include the study of innovation driven by climate change. In addition to cost-benefit analysis, sustainability impact assessment and other quantitative simulation models will be developed. One of the methods used will be life cycle assessment analysis.

InnoRenew CoE project activities: InnoRenew CoE will prepare a data management plan and offer methodological and statistical support for data collection and analysis for the whole project. Research activites will include: a review of the literature on innovation in the forest sector; a qualitative study of Austrian and Slovenian companies in the forest sector; and a life cycle assesment study.

Optimization problems of the residual biomass value chain

PROJECT LEADER: Jakub Michal Sandak, PhD
PERIOD: 01.01.2020 – 31.12.2021
FINANCED: Slovenian Research Agency (ARRS)
PARTNERS: InnoRenew CoE (Slovenia) and Vienna University of Technology (Austria)

Project summary: Dealing with agricultural residues can present significant extra costs to farmers as these residues are usually processed on the field either by burning or mulching. Meanwhile, recent growth of the bio-based industrial sector can provide an alternative use for these materials. Because bio-based industries need a stable supply of high-quality raw materials, connecting these industries with sources that can supply this type of raw material at the best possible price is important. However, this process is not a simple one. The availability of certain materials changes significantly based on location and industrial demand for different residues shows high variance. Development of an efficient supply chain would be beneficial for both farmers and industries. As a result of this project, basic research will be carried out looking into the value chain of residual biomass and possible optimization questions will be studied and identified. Because this value chain includes multiple actors, there are multiple possible problem sets, which can range from collecting and sorting the residues on site to transporting them to bio-refineries for processing. Selected problems will be explored and modelled in more detail, and solution algorithms will be developed to solve them. As the arising problems are NP-hard, these will most likely be approximation algorithms. Models and algorithms will not only consider basic theoretical aspects of the problems but application-oriented characteristics will also be studied in more detail. Dealing with these characteristics is important as we intend these algorithms to be efficiently applicable in a real-life scenario. Efficiency of these methods will be tested on artificial instance sets.

InnoRenew CoE project activities: InnoRenew CoE will contribute to the project with analysis of the industrial problem and selection of the problem set to be studied; specification of the basic model for the selected problem; and development of artificial instance sets for testing the solution methods.

Inovacijske aktivnosti avstrijskih in slovenskih podjetij v gozdno-lesni verigi vrednost

VODJA PROJEKTA: dr. Ana Slavec
TRAJANJE: 1. 1. 2020 – 31. 12. 2021
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
PARTNERJA: InnoRenew CoE (Slovenija) in Inštitut za sistemske znanosti, inovacije in raziskave trajnostnega razvoja na Univerzi v Gradcu (Institute for System Sciences, Innovation and Sustainability Research, University of Graz) (Avstrija)

Opis projekta: Medtem ko je avstrijska gozdna panoga gospodarsko krizo preživela brez večje škode, se prihodki slovenskih podjetij v gozdno-lesni verigi zmanjšujejo že od leta 2008, ko je bilo zaprtih več velikih podjetij. V okviru bilateralnega projekta bomo razširili sekundarno analizo podatkov CIS in primerjali inovacijske dejavnosti slovenskih in avstrijskih podjetij v panogi. Dobili bomo dostop do podatkov CIS za Avstrijo in izvedli enake analize, kot smo jih za Slovenijo. Natančneje, primerjali bomo vpeljavo produktnih, procesnih, organizacijskih in tržnih inovacij, inovacijske aktivnosti in izdatke, javno finančno podporo za inovacijske dejavnosti, vire informacij in sodelovanja pri inovacijah izdelkov in procesov ter dejavnike, ki ovirajo inovacijske dejavnosti. Primerjalna analiza nam bo omogočila, da bolje pojasnimo razloge za zaostajanje slovenskih podjetij. Drugi dejavnik uspeha v panogi je lastniška in upravljavska struktura podjetij. Za obravnavo tega raziskovalnega vprašanja bomo uporabili tako kvantitativne kot kvalitativne metod. Z izbranimi podjetji v Avstriji in Sloveniji bomo opravili kvalitativne intervjuje, kjer se bomo osredotočili na primerjavo lastniških in upravljavskih struktur. Analiza izbranih študij primera nam bo pomagala razumeti odnos med temi strukturami in uspehom podjetja. Eden od raziskovalnih primerov bo tudi študija čebelarjev z vidika sprejemanja inovacij in njihove širitve, ki se bo posvetila razvoju prihodnjih scenarijev v okviru gospodarskih, okoljskih in socialnih izzivov. To bo vključevalo študijo inovacij, ki jih poganjajo podnebne spremembe. Poleg analize stroškov in koristi, presoje vplivov na trajnostnost in drugih kvantitativnih simulacijskih modelov bo uporabljena tudi metoda ocenjevanja življenjskega cikla.

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE bo pripravil načrt upravljanja podatkov in nudil metodološko in statistično podporo pri zbiranju in nalizi podatkov. Raziskovalne dejavnosti bodo vključevale pregled literature o inovacijah v gozdnem sektorju, kvalitativno raziskavo avstrijskih in slovenskih podjetij v tem sektorju ter študijo z metodo ocenjevanja življenjskega cikla.

Izzivi pri optimizaciji verige vrednosti ostankov biomas

VODJA PROJEKTA: dr. Jakub Michal Sandak
TRAJANJE: 1. 1. 2020 – 31. 12. 2021
FINANCIRANJE: Javna agencija za raziskovalno dejavnost Republike Slovenije (ARRS)
PARTNERJA: InnoRenew CoE (Slovenija) in Tehniška univerza na Dunaju (Technische Universität Wien) (Avstrija)

Opis projekta: Obravnavanje kmetijskih ostankov lahko povzroči precejšnje dodatne stroške za kmete, saj se običajno predelujejo na polju s sežiganjem ali mulčenjem. Industrijski sektor, ki temelji na biotskih virih, pa bi zaradi nedavne rasti lahko zagotovil alternativno uporabo teh materialov. Ker industrija, ki temelji na biotskih virih, potrebuje stabilno oskrbo s kakovostnimi surovinami, je pomembno, da jo povežemo z viri, ki ji to lahko zagotovijo po najboljši možni ceni. Vendar ta proces ni preprost; razpoložljivost nekaterih materialov se bistveno spreminja

glede na lokacijo, pri industrijskem povpraševanju po različnih ostankih pa je veliko nihanj. Razvoj učinkovite dobavne verige bi koristil tako kmetom kot industriji. Rezultat tega projekta bo izvedba temeljne raziskave, pri kateri se bodo pregledale vrednostne verige ostankov biomas in proučila ter opredelila morebitna vprašanja optimizacije. Ker vrednostna veriga vključuje več akterjev, obstaja več mogočih problemskih sklopov, povezanih s celotnim procesom od zbiranja in razvrščanja ostankov na samem kraju do njihovega prenosa v biorafinerije za predelavo. Izbrani problemi bodo podrobneje raziskani in modelirani, razviti bodo tudi algoritmi za njihovo reševanje. Ker so omenjeni problemi NP-težki, bodo razviti algoritmi aproksimacijski. Modeli in algoritmi ne bodo upoštevali le osnovnih teoretičnih vidikov problemov, temveč bodo podrobneje proučene tudi aplikativne značilnosti. Upoštevanje teh značilnosti je pomembno za zagotavljanje učinkovite rabo rezultatov v praksi. Učinkovitost teh metod bo preizkušena na umetno pripravljenih množicah podatkov.

Glavne dejavnosti InnoRenew CoE pri projektu: InnoRenew CoE bo skrbel za analizo industrijskega problema in izbiro množice problemov ter specifikacijo osnovnega modela izbranega problema in pripravo umetnih primerov, ki bodo uporabljeni za testiranje rešitev.

Grant applications in 2019

National applications

Twenty proposals were submitted for national funding to the Slovenian Research Agency (ARRS) for a total budget of EUR 679,232.60; a majority of these proposals involve bilateral cooperation, including Austria (two), Serbia (two), Germany (two), France (one) and the United States (two). Two of the ARRS grant submissions were applications for new research programs, one of which the InnoRenew CoE submitted as coordinator. In addition, InnoRenew CoE applied for reimbursement of five projects submitted to Horizon 2020 (all successfully reimbursed) and four other applications to reimburse membership fees in international associations (one was positively assessed).

International applications

There were 24 international applications submitted by InnoRenew CoE staff for a total budget of EUR 6,749,733.12. **Twelve of these applications were submitted to Horizon 2020**; seven of them listing InnoRenew CoE as the coordinator, including three Marie Skłodowska-Curie Actions (individual fellowships), one European Research Council starting grant and eight grants in other schemes. Other applications were submitted to the Erasmus+ program (two), COST Actions for membership (five) and one project related to cooperation with Hungary's National Research, Development and Innovation Office.

The combined budget of all 44 submitted proposals designated for InnoRenew CoE was EUR 7,428,965.72; currently, there are **18 pending proposals** (nine national, nine international) with a potential budget for InnoRenew CoE of EUR 4,643,601.32. For the remainder, there were nine unsuccessful proposals (total of EUR 2,764,892.00) and **13 successful proposals** (total of EUR 156,268.72) for InnoRenew CoE in 2019.

Prijave na razpise v letu 2019

Prijave na državne razpise

Na slovensko raziskovalno agencijo (ARRS) je bilo vloženih 20 predlogov za financiranje (v skupni vrednosti 679.232,60 EUR), od tega večina prijav predstavlja dvostransko mednarodno sodelovanje (dve z Avstrijo, dve s Srbijo, dve z Nemčijo, ena s Francijo in dve z ZDA). Med najpomembnejšimi sta dve prijavi za nove raziskovalne programe, od katerih je ena, ki jo je InnoRenew CoE predložil kot koordinator. Poleg tega je InnoRenew CoE zaprosil za povračilo stroškov za pet projektov, predloženih programu Obzorje 2020 (vsi uspešno povrnjeni), in oddal še štiri prijave za povračilo članarin v mednarodnih združenjih (pozitivno je bila ocenjena ena).

Prijave na mednarodne razpise

Raziskovalci InnoRenew CoE so prijavili 24 mednarodnih projektov (njihova skupna vrednost je 6.749.733,12 EUR). Med temi je bilo **12 prijav na razpise v okviru programa Obzorje 2020**. Pri sedmih od njih je InnoRenew CoE zastopan kot koordinator projekta, vključno s prijavami na tri akcije Marie Skłodowska-Curie (MSCA) (individualne štipendije) in eno subvencijo Evropskega raziskovalnega svet (ERC) za začetek samostojne poti (ERC starting grant), osem projektov pa je prijavljenih v drugih shemah. Poleg tega sta bili dve prijavi oddani na razpis v okviru programa Erasmus+, pet za funkcije članov upravnih odborov akcij COST, ena vloga za projekt pa je bila oddana v sodelovanju z madžarskim Nacionalnim uradom za raziskave, razvoj in inovacije (Nemzeti Kutatási, Fejlesztési és Innovációs Hivata – NKFIH).

Skupna vrednost vseh 44 oddanih vlog InnoRenew CoE znaša 7.428.965,72 EUR. V evalvaciji je še 18 prijav (devet nacionalnih in devet mednarodnih) v vrednosti 4.643.601,32 EUR za InnoRenew CoE. Devet prijav (v vrednosti 2.764.892 EUR) je bilo za InnoRenew CoE v letu 2019 neuspešnih, **13 predlogov pa je bilo odobrenih**, in sicer v vrednosti 156.268,72 EUR.

Equipment and infrastructure
Oprema in infrastruktura

Equipment

The investment project "Renewable Materials and Healthy Environments Research and Innovation Centre of Excellence" represents an investment in construction of infrastructure as well as purchase and installation of equipment. It is co-financed by the European Regional Development Fund within the framework of the Operational Programme for the Implementation of the EU Cohesion Policy in the period 2014-2020 in Slovenia and the Republic of Slovenia Ministry of Education, Science and Sport. The purpose is to build needed research infrastructure to provide top-level knowledge and carry out research and innovation in the field of renewable materials and healthy environments.

In 2019, 36 pieces of laboratory equipment were purchased through the investment project, including 16 items for the woodworking lab, five items to support all labs, four items for the characterization lab, four items for the human health in the built environment lab, four items for the renewable material composites lab, two items for physical testing and one microscope.

Infrastructure

Activities in 2019 related to construction of the InnoRenew CoE buildings in Izola included obtaining certain approvals that allowed construction to be announced and begin, completion of the first phase of preparatory work in early July and re-launch of the public procurement for construction. InnoRenew CoE also conducted a revision of the Implementation Project (PZI) to correct certain irregularities, which were identified by supervisory and control reviews, and reduce costs. In addition, the institute secured temporary office and lab space in Koper and Izola. The InnoRenew CoE team completed interior designs for the temporary spaces and, through public tender, selected and purchased furniture for them. This furniture will be transferred to the InnoRenew CoE facilities after construction is completed. With the help of partners from abroad, the institute planned internal acoustics of the InnoRenew CoE buildings. There was also an investment in media promotion of the planned construction with visual materials, videos, articles, publications, virtual reality models and television interviews.

Oprema

Investicijski projekt »Center odličnosti za raziskave in inovacije na področju obnovljivih materialov in zdravega bivanjskega okolja« je namenjen naložbi v izgradnjo infrastrukture ter nakup in montažo opreme. Investicijski projekt sofinancirata Evropski sklad za regionalni razvoj v okviru Operativnega programa za izvajanje evropske kohezijske politike v obdobju 2014–2020 v Sloveniji in Ministrstvo za izobraževanje, znanost in šport Republike Slovenije. Namen investicije je izgradnja raziskovalne infrastrukture, ki je potrebna za zagotavljanje vrhunskega znanja ter za izvajanje raziskav in inovacij na področju obnovljivih materialov in zdravega bivanjskega okolja.

V letu 2019 je bilo pridobljenih 36 kosov laboratorijske opreme, namenjenih raziskovanju, od tega 16 za mizarski laboratorij, pet kosov, ki bodo v pomoč vsem laboratorijem, štiri za laboratorij za karakterizacijo, štiri za laboratorij za raziskovanje zdravja ljudi v grajenem okolju, štiri za laboratorij za kompozite iz obnovljivih materialov, dva za fizikalno testiranje in en mikroskop.

Infrastruktura

Dejavnosti, povezane z izgradnjo kompleksa raziskovalnega inštituta InnoRenew CoE v Izoli, so obsegale pridobitev nekaterih soglasij, ki so omogočile začetek gradnje, prijavo začetka gradnje, izvedbo prve faze pripravljalnih in zemeljskih del, ki smo jih zaključili v začetku julija, ter ponovno objavo javnega razpisa za gradbena, obrtniška in inštalacijska (GOI) dela. InnoRenew CoE je načrtoval tudi monitoring objekta in jasno začrtal izvedbo vseh raziskovalnih ciljev, ki jih bomo proučevali na objektu. Marca je bil izveden čistopis projekta za izvedbo (PZI) zaradi potrebnih pocenitve in odprave določenih nepravilnosti, na katere sta opozorili recenziji supernadzora in nadzora. Ekipa InnoRenew CoE je poleg tega naredila načrt notranje opreme v začasnih prostorih v Kopru in Izoli in zanje na razpisu izbrala pohištvo, ki bo po izgradnji inštitutskega kompleksa premeščeno v nove prostore. Skupaj s partnerji iz tujine je zasnovala tudi notranjo akustiko objektov inštituta. Za medijsko promocijo predvidene gradnje je InnoRenew CoE poskrbel s slikovnimi gradivi, video prispevki, publikacijami, modelom virtualne resničnosti in intervjuji za televizijo.

Table 5: Equipment purchased through the InnoRenew project in 2019

Preglednica 5: Oprema, pridobljena leta 2019 v okviru projekta InnoRenew

	Equipment	Laboratory
1	Dynamic Vapour Sorption (DVS – Surface Measurement Systems)	Characterisation
2	MPA II Bruker Optics Spectrometer, FT-NIR Multi Purpose Analyzer	Characterisation
3	VIAVI MicroNIR™ OnSite-W Spectrometer	Characterisation
4	VIAVI MicroNIR™ PAT-W Spectrometer	Characterisation
5	Hettich Centrifuge Universal 320 R	Human health in the built environment
6	Life Science Data Acquisition System for Psychophysiology	Human health in the built environment
7	PAL Technologies activPal4 micro, Lightweight Activity Monitoring Wearable PAL Solution	Human health in the built environment
8	Phoenix Instruments Incubation Shaker, IS-OS 20	Human health in the built environment
9	Leica DCM8 Microscope, 3D Optical Surface Metrology System	Microscopy
10	Thermal Camera	Physical testing
11	Zwick Roell Z100 Universal Testing Machine	Physical testing
12	Fire Safety Devices for Storage of Flammable Liquids, 30 minutes, en-30-120	Renewable materials composites
13	Mettler Toledo 10 kg Scale and 300 g Scale	Renewable materials composites
14	Nabertherm RSRC 120-1000/13 Tube Furnace	Renewable materials composites
15	Ultimaker 3, 3D Printer	Renewable materials composites
16	ACword FT302 Mobile Dust Exhaust System	Woodworking
17	ACword FT400 Mobile Dust Exhaust System	Woodworking
18	ELMAG Superturn 700/140 - Vario Universal Turner/Router for Metal	Woodworking
19	HÖCKER POLYTECHNIK Vacumobile VT250 Dust Exhaust System	Woodworking
20	JET 16-32 Plus Mini Widebelt Sander	Woodworking
21	SCM AS16 Horizontal Mortiser	Woodworking
22	SCM ECO 300S Mobile Dust Exhaust System	Woodworking
23	SCM F520 CLASS Planer	Woodworking
24	SCM S600p Bandsaw	Woodworking
25	SCM S630 CLASS Thicknesser	Woodworking
26	SCM SC2c Small Format Sliding Table Circular Saw	Woodworking
27	SCM SD 60 RCS (1100mm) Widebelt Sander	Woodworking
28	SCM Si5 Linvincibile Large Format Sliding Table Circular Saw	Woodworking
29	SCM T124 Wood Lathe	Woodworking
30	SCM TI 105 NOVA Spindle-Moulder	Woodworking
31	VOLPATO LBK150 Edge Sander	Woodworking
32	Annual maintenance of licenses	/
33	Anti-vibration tables	/
34	Work desk with connecting element	/
35	Work desk with drawer and work chairs	/
36	Work table	/

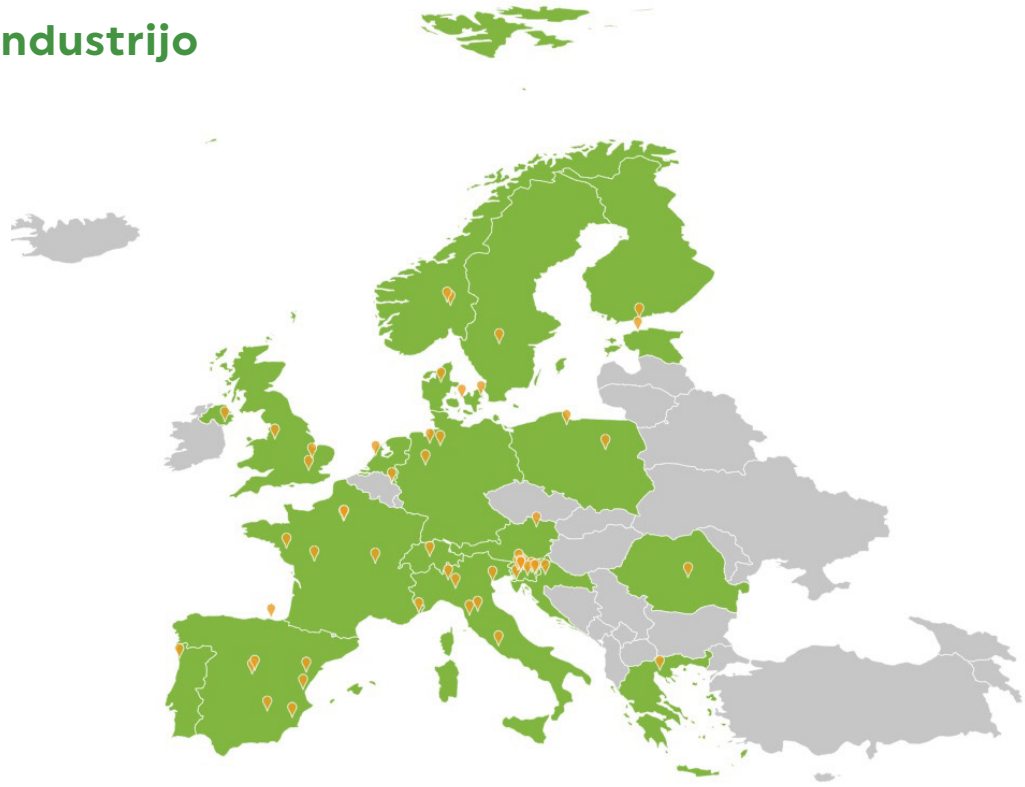
Table 6: InnoRenew CoE infrastructure activities in 2019

Preglednica 6: Dejavnosti InnoRenew CoE v letu 2019 na področju infrastrukture

Date	Activity	Purpose
January 11, 2019	Project consensus from Elektro Primorska, d.d. was obtained	Preparation for construction
January 14, 2019	Public procurement for construction supervision closed; one offer received from Projekt, d.d.	Public procurement- construction supervision
January 25, 2019	Public procurement for construction closed; one offer received from consortium of companies VG5 d.o.o. with partners Marles Hiše Maribor, Riko, Kolektor Koling, Kolektor CPG; the value of the offer exceeded available funds substantially, so it was rejected	Public procurement- construction
February 1, 2019	Use of additional office space for InnoRenew CoE in University of Primorska dormitory secured; office furniture planning started	Temporary additional arrangement of office spaces in Koper
February- March 2019	Production of building visualizations and presentation material	Presentation material
February 15, 2019	Presentation of the planned Building and Research Areas of InnoRenew CoE to the Minister of Education, Science and Sport, dr. Jernej Pikalo, Secretary of State Martina Vuk, Mayor of Izola Danilo Markočič, Chairman of the Committee on Environment and Spatial Planning in the Municipality of Izola Alexei Skok, Head of the Cabinet of Mayor of Izola Polonci Skendžič and Rector of the University of Primorska, dr. Dragan Marusic	Project presentation
March 3, 2019	Completed findings from the super-audit report on PZI (detail planning)	PZI review
March 25, 2019	Meeting with the InnoRenew CoE Facilities Construction Supervisor; supervisor comments on certain shortcomings and ambiguities in the PZI documentation	PZI review
March 19, 2019	Rationalization of the PZI project due to required cost reduction and correction of project weaknesses commented by Construction Supervisor; production of PZI optimisation for the needs of new estimated value and for the use on construction site	PZI optimisation
March - May 2019	Development of a virtual reality model in cooperation with the University of Primorska	VR Model
March - June 2019	Building monitoring planning for research purposes	Building monitoring planning
April 5, 2019	Start of activities to promote InnoRenew CoE Building plans through press releases, video and image materials	Media releases
April 15, 2019	Start of implementation of DIIP and IP amendment for InnoRenew CoE buildings with increased investment value	DIIP and IP amendment
April 19, 2019	Selection and tendering of furniture for offices and laboratories of different suppliers for the future InnoRenew CoE buildings and for equipment of temporary offices in Koper	Furniture selection
April 22, 2019	Revision of the VR model of InnoRenew CoE buildings and latest comments before public announcement	VR Model
April 24, 2019	Signing of a tripartite construction contract for preparatory and ground work with Komunala Izola, d.o.o. and RM KOP, d.o.o.	Start of construction
April 29, 2019	Construction Supervision contract for preparatory and ground work on the building plot of the InnoRenew CoE	Start of construction
April 29, 2019	Marking out of planned buildings of InnoRenew CoE at the Livade construction site and reporting the start of construction to Inšpektorat RS za delo	Start of construction
April 30, 2019	Reporting the start of construction to UE Izola	Start of construction
May 10, 2019	Press conference at Izola municipality on InnoRenew CoE Building Project	Media releases
May 13, 2019	Introduction to contractors' work (Komunala Izola, d.o.o. and RM KOP, d.o.o.) and introduction to Construction Supervisor's work (Projekt, d.d.)	Start of construction
May 14, 2019	Start of work at InnoRenew CoE construction site	Construction

Date	Activity	Purpose
May 17, 2019	Investment program update (IP) and change of InnoRenew CoE operation (contract C3330-18-952000 on co-financing the operation of the "Renewable Materials and Healthy Environments Research and Innovation Center of Excellence - InnoRenew COE") delivered to the Ministry of Science, Education and Sport; reconciliation of the text with Ministry of Science, Education and Sport follows	IP amendment
May 31, 2019	Amendment of the investment program (IP) of InnoRenew CoE operation submitted to the Ministry of Science, Education and Sport with application to accept the new proposal of the investment program	IP amendment
June 3, 2019	Beginning of the renovation planning of premises in Old Pošta building in Koper for the arrangement of temporary laboratories	Temporary additional arrangement of laboratory spaces in Koper
June 17, 2019	Execution of test excavations at the InnoRenew CoE site	Construction
June 17, 2019	Acoustics planning for InnoRenew CoE facilities started in collaboration with Finnish company Lumir OY	Designing acoustics
June 21, 2019	Public procurement for construction published	Public procurement-construction
July 1, 2019	Start of use of new offices and technical workshop in Izola's industrial zone; planning furniture for offices	Temporary additional arrangement of spaces in Izola
July 1, 2019	Public procurement for office furniture published	Public procurement-furniture
July 2, 2019	Completion of first phase contract work at the InnoRenew CoE construction site with Komunala Izola, d.o.o. and RM KOP, d.o.o.; handing over documentation and construction logs	Construction
July 5, 2019	Confirmation of the final calculation of the excavation of earth, preparatory and earthworks at the InnoRenew CoE site by the Construction Supervisor	Construction
July 11, 2019	Start of reviewing project documentation for the construction of an underground garage on Muzejski trg and considering measures to mitigate the danger and tremors of the Old Pošta building where temporary InnoRenew premises are arranged	Temporary additional arrangement of spaces in Izola and Koper
July 17, 2019	Public procurement for office furniture completed; several offers for each group were received	Public procurement-furniture
July 23, 2019	Submission of drawings and inventory of works for the renovation of Old Pošta building in Koper	Temporary additional arrangement of spaces in Koper
August 8, 2019	Order of anti-vibration tables for temporary premises in old Pošta building in Koper	Temporary additional arrangement of spaces in Koper
August 21, 2019	Confirmation and signature of all stakeholders of the Investment Program (IP) amendment and the InnoRenew CoE operation	IP amendment
September 9, 2019	Acoustics planning for InnoRenew CoE facilities in collaboration with Finnish company Lumir OY	Designing acoustics
October 8, 2019	Supply and installation of furniture for temporary offices in Izola and Koper	Temporary additional arrangement of spaces in Izola and Koper
October 23, 2019	SloWoodLife conference where several InnoRenew CoE researchers lectured on the subject of wooden construction in Slovenia; in addition to the lectures, the magazine Varčna hiša was published where InnoRenew CoE researchers wrote several articles; at the event, the planned buildings of the InnoRenew CoE Institute were presented as part of a lecture and in the form of virtual reality	Media releases
November 11, 2019	University of Primorska issues Consent for temporary use of land on an adjacent plot for the period of InnoRenew CoE buildings construction	Construction

Industrial collaboration
Sodelovanje z industrijo



Locations of InnoRenew CoE industrial partners. Image: InnoRenew CoE
Lokacije industrijskih partnerjev InnoRenew CoE. Foto: InnoRenew CoE

InnoRenew CoE currently works with 61 national and international industry partners through both consortium projects and direct collaboration. Transfer of knowledge within these partnerships allows us to foster innovation and competitiveness in the bio-based materials sector.

InnoRenew CoE neposredno ali preko konzorcijskih projektov trenutno sodeluje z 61 nacionalnimi in mednarodnimi industrijskimi partnerji. Prenos znanja v okviru teh partnerstev inštitutu omogoča pospeševanje inovacij in konkurenčnosti na področju materialov biotskega izvora.

Consortium projects

In addition to ongoing projects "CLICKdesign delivering fingertip knowledge to enable service life performance specification of wood", "Dynamic Response of Tall Timber Buildings under Service Load" (DynaTTB), "Underpinning the vital role of the forest-based sector in the Circular Bioeconomy" (WoodCircus), "Wood and wood products over a lifetime" (WOOLF) and "Development of novel functional proteins and bioactive ingredients from rapeseed, olive, tomato and citrus fruit side streams for applications in food, cosmetics, pet food and adhesives" (Pro-Enrich), we added two additional research projects with industrial partners in 2019: "Pilots for Healthy and Active Ageing" (PHArA-ON) and "Selective extraction of high value molecules from forest products processing residues in the specialty chemicals sector."

Konzorcijski projekti

Poleg že obstoječih projektov – Zagotavljanje »fingertip« znanja, ki omogoča določitev lastnosti lesa v odvisnosti od življenjske dobe – CLICKdesign; Dinamični odziv visokih lesenih zgradb pri uporabni obratovalni obtežbi (DynaTTB); Podpiranje ključne vloge gozdno-lesnega sektorja v krožnem biogospodarstvu (WoodCircus); Les in leseni izdelki v življenjski dobi (WOOLF) in Razvoj novih uporabnih proteinov in bioaktivnih sestavin iz stranskih proizvodov predelave repičnih semen, oliv, paradižnika in agrumov za uporabo v hrani, kozmetiki, živalski hrani ter lepilih (Pro-Enrich) – je InnoRenew CoE v letu 2019 pridobil še dva nova raziskovalna industrijska projekta z industrijskimi partnerji: Pilotne raziskave za zdravo in aktivno staranje (PHArA-ON) in Selektivna ekstrakcija molekul z visoko vrednostjo za sektor specialnih kemikalij iz ostankov predelave lesa.

"At Jelovica, we are aware of the importance of research activities for our development and innovation. Therefore, we are glad to be part of CLICKdesign, through which we are getting more information about timber façade performance and modelling as well as interactions with InnoRenew CoE and other foreign institutions." – Boštjan Ber, PhD, head of research and development at Jelovica hiše d.o.o. (Slovenia)

»V podjetju Jelovica se zavedamo pomena raziskovalnih dejavnosti za naš razvoj in inovacije. Zato smo veseli, da smo del projekta CLICKdesign, s pomočjo katerega pridobivamo več informacij o obnašanju in modeliranju lesenih fasad ter sodelujemo z InnoRenew CoE in tujimi inštituti.« – Dr. Boštjan Ber, vodja raziskav in razvoja v podjetju Jelovica hiše, d. o. o. (Slovenija)

Boštjan Ber. Image/Foto: Jelovica hiše, d. o. o.

Yoker building. Image: CCG and Stora Enso
Zgradba Yoker. Foto: CCG and Stora Enso

"As a contemporary engineering company, Smith and Wallwork is always striving to include new research findings and state of the art in our design work. Collaborating with InnoRenew CoE through the DynaTTB project enables us to broaden our knowledge of dynamic behavior of buildings as well as first-hand access to experimental results. We are looking forward to further collaboration in other areas so that we can further optimize our engineering process." – Fernando Perez, engineer at Smith and Wallwork Ltd (United Kingdom)

»Ker je podjetje Smith and Wallwork sodobno inženirsko podjetje, si v njem vedno prizadevamo, da bi v svoje projektantsko delo vključili najnovejše raziskovalne ugotovitve in najsodobnejše znanje. Sodelovanje z raziskovalnim inštitutom InnoRenew CoE pri projektu DynaTTB nam omogoča širiti znanje o dinamičnem odzivu stavb in dobiti tudi neposreden dostop do rezultatov poskusov. Veselimo se nadaljnjega sodelovanja tudi na drugih področjih, saj bomo tako lahko še bolj optimizirali naš inženirski proces.« – Fernando Perez, inženir v podjetju Smith and Wallwork Ltd (Združeno kraljestvo)

Office building near Graz, Austria, Image: REM, d. o. o. / Poslovna stavba v bližini v Gradca v Avstriji. Foto: REM, d. o. o.

David Močnik. Image/ Foto: REM, d. o. o.

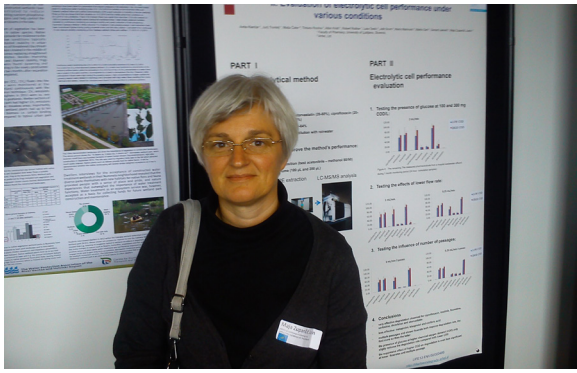
"Within the WOOLF project, we are collaborating with InnoRenew CoE on the topic of multi-story modular building design. We see replacing standard materials in our modules with more sustainable materials made from wood as one of the key future trends. The help of InnoRenew CoE's researchers and their knowledge of dynamic design of multi-story timber buildings and experimental testing has proved very valuable for the efficient design of our new modules." – Dr. David Močnik, head of research and development at REM, d.o.o. (Slovenia)

»V okviru projekta WOOLF sodelujemo z raziskovalnim inštitutom InnoRenew CoE na temo projektiranja večnadstropnih modularnih stavb. Nadomestitev standardnih materialov v naših modulih z bolj trajnostnimi proizvodi iz lesa vidimo kot enega od ključnih prihodnjih trendov. Pomoč raziskovalcev z inštituta InnoRenew CoE z njihovim znanjem o dinamičnem projektiranju večnadstropnih stavb iz lesa ter znanjem na področju eksperimentalnih testov se je izkazala za zelo koristno pri učinkoviti zasnovi naših novih modulov.« – Dr. David Močnik, vodja raziskav in razvoja v podjetju REM, d. o. o. (Slovenija)

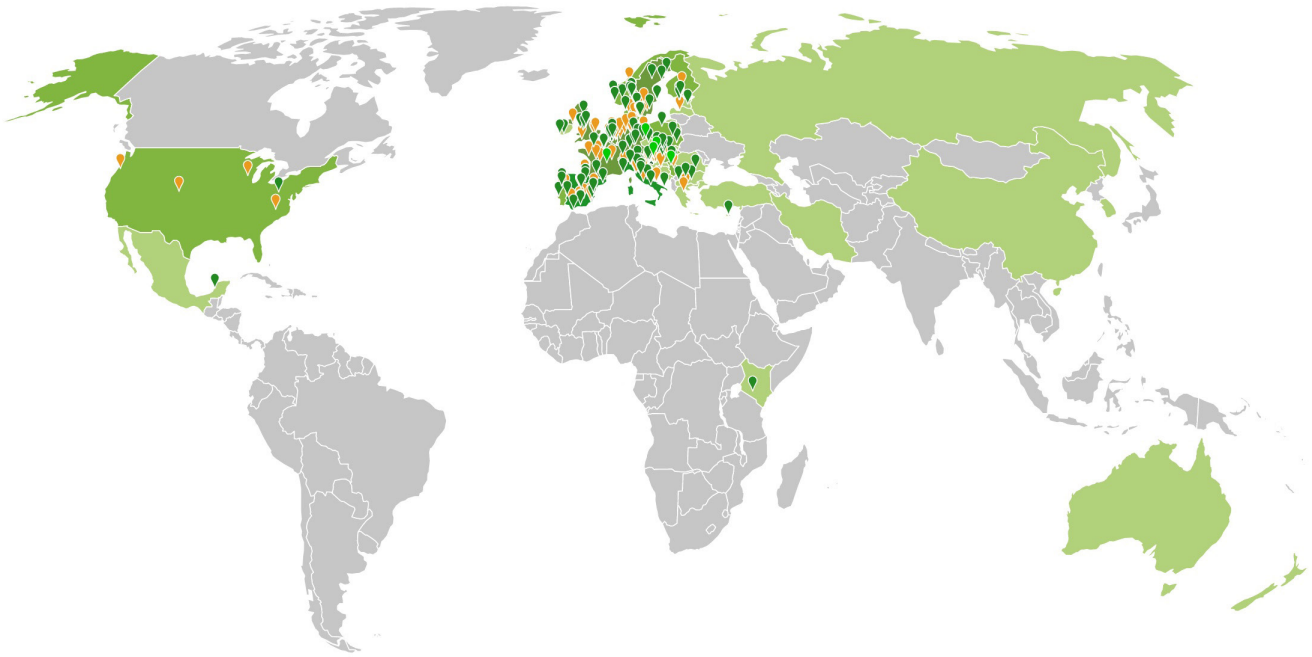
Building constructed by REM, our partner in the WOOLF project. Image: REM, d.o.o./Stavba, ki jo je zgradilo podjetje REM, partner pri projektu WOOLF. Foto: REM, d. o. o.

"ARHEL is a company with an engineering background, which has in the last five years greatly enhanced its orientation in biotechnology and environmental technology. Recently, we focused on the development of production tools and methods for industrial-scale recovery and purification of proteins from side streams of the dairy industry. Our vision is to expand the methods to other natural resources from industry side streams and residues. In this respect, InnoRenew CoE supports us in developing analytics and supportive separation and purification techniques that we do not cover ourselves." – Dr. Maja Zupančič Justin, ARHEL, projektiranje in inženiring d.o.o. (Slovenia)

»ARHEL je podjetje z izkušnjami v inženirstvu, ki je v zadnjih petih letih močno okrepilo svojo usmerjenost v biotehnologijo in okoljsko tehnologijo. V zadnjem obdobju se osredotočamo na razvoj proizvodnih orodij in metod za industrijsko pridobivanje in čiščenje beljakovin iz stranskih tokov mlekarstva. Naša vizija je razširitev teh metod na druge naravne vire iz stranskih tokov in ostankov industrije. V tem pogledu nas raziskovalni inštitut InnoRenew CoE podpira pri razvoju analitike in podpornih tehnik ločevanja in čiščenja, ki jih sami ne obvladujemo.« – Dr. Maja Zupančič Justin, ARHEL, projektiranje in inženiring, d. o. o. (Slovenija)



Maja Zupančič Justin. Image/Foto: REM d. o. o.



Locations of InnoRenew CoE industrial project partners. Image: InnoRenew CoE
Lokacije industrijskih partnerjev, s katerimi InnoRenew CoE sodeluje pri projektih. Foto: InnoRenew CoE

"Chimar Hellas S.a., leading the development and application of industrial technology for the production of binder systems for wood-based panels, engineered wood, laminates and composites as well as a pioneer in the development of bio-based adhesives, had the opportunity to collaborate with InnoRenew CoE in the framework of European research project Pro-Enrich and, thus, benefit from InnoRenew CoE's knowledge on renewable materials, incorporating it into industrial practice." – Eleftheria Athanassiadou, R&D Support Manager/IP Protection Manager at Chimar Hellas S.a. (Greece)

»V Chimar Hellas S.a., vodilnem podjetju na področju razvoja in uporabe industrijskih tehnologij za proizvodnjo lepilnih sistemov za lesne plošče, tehnološki gradbeni les, laminate in kompozite pa tudi pionirju pri razvoju lepil, temelječih na biotski osnovi, smo imeli pri evropskem raziskovalnem projektu Pro-Enrich priložnost sodelovati z raziskovalnim inštitutom InnoRenew CoE. Znanje InnoRenew CoE s področja obnovljivih materialov, ki smo ga vpeljali tudi v industrijsko prakso, nam je pri tem zelo koristilo.« – Eleftheria Athanassiadou, vodja oddelka za podporo raziskavam in razvoju in vodja oddelka za zaščito pravic intelektualne lastnine v Chimar Hellas S.a. (Grčija)

METADYNEA METAFRAX GROUP REM ARHEL projektiranje in inženiring d.o.o. CHIMAR JELOVICA

Direct collaboration

In addition to Metadynea and Hotel Impero Cortina/ GrisDainese Architects, we added nine new direct industrial collaborations in 2019, including Kronospan Trading SRL (Romania), Riko hiše d.o.o. (Slovenia), VUDEX družba za trgovanje s pohištvom, d.o.o. (Slovenia), Intec MKD (Slovenia), Neue Holzbau AG (Switzerland), MM Delta (Slovenia), Mardom Pro (Poland), and Feniks (Poland).

Neposredno sodelovanje

Ob sodelovanjih s podjetjem Metadynea in hotelom Impero Cortina d'Ampezzo / arhitekturnim studiem GrisDainese je raziskovalni inštitut InnoRenew CoE v letu 2019 navezal še devet novih neposrednih sodelovanj na področju industrije, in sicer z ustanovami Kronospan Trading SRL (Romunija), Riko hiše, d. o. o. (Slovenija), VUDEX družba za trgovanje s pohištvom, d. o. o. (Slovenija), Intec MKD (Slovenija), Neue Holzbau AG (Švica), MM Delta (Slovenija), Mardom Pro (Poljska) in Feniks (Poljska).

"It is a perfect situation for an industrial company if their technical needs match the knowledge and experience of an academic institute. In this case, I knew Dr. Andreja Kutnar, director of InnoRenew CoE, from a conference and accepted her invitation to Koper to talk about Metadynea's research activities and plans for the future as a producer of resins and other chemicals for woodworking and related industries. Three months later, we signed a contract for fruitful collaboration resulting in the 'MetaDense Wood Densification Process', a procedure for densifying low-density wood with highly stable compressive deformation. MetaDense wood has improved properties like density, hardness and strength. Less than a year after the project began, we filed a patent application and signed a contract for extended cooperation. Sometimes success stories come unplanned and are so beautiful! Thanks a lot, Andreja!" – Dr. Wolfgang Kantner, R&D manager at Metadynea (Austria)

»Za industrijsko podjetje je izjemno ugodno, če njegove tehnične potrebe sovpadajo z znanjem in izkušnjami akademskega inštituta. Dr. Andrejo Kutnar, direktorico raziskovalnega inštituta InnoRenew CoE, sem spoznal na konferenci in sprejel njeno povabilo v Koper, da predstavim raziskovalne dejavnosti in načrte za prihodnost podjetja Metadynea, proizvajalca smol in ostalih kemikalij za lesno in sorodne industrije. Tri mesece pozneje smo podpisali pogodbo, na podlagi katere je uspešno sodelovanje privedlo do ›procesa zgoščevanja lesa MetaDense‹, postopka za zgoščevanje lesa z nizko gostoto ter visoko stabilnimi tlačnimi deformacijami. Les MetaDense ima izboljšane lastnosti, kot so gostota, trdota in trdnost. Manj kot leto dni po začetku projekta smo vložili patentno prijavo in podpisali pogodbo za nadaljnje sodelovanje. Včasih zgodbe o uspehu pridejo nenačrtovano in so prelepe! Najlepša hvala, Andreja!« – Dr. Wolfgang Kantner, vodja raziskav in razvoja v podjetju Metadynea (Avstrija)

Wolfgang Kantner.
Image/Foto: Metadynea

Table 7: InnoRenew CoE industrial partners

Preglednica 7: Industrijski partnerji v letu 2019

	Industrial Partner	Country	Sector	InnoRenew CoE Project
1	HOTEL IMPERO	Italy	Tourism	Direct collaboration
2	GRISDAINESE ARCHITECTS	Italy	Architecture	Direct collaboration
3	METADYNEA AUSTRIA	Austria	Chemical	Direct collaboration
4	M SORA	Slovenia	Wood	WOOLF
5	L-TEK	Slovenia	Manufacturing	WOOLF
6	REM	Slovenia	Manufacturing	WOOLF
7	XLAB	Slovenia	ICT	WOOLF
8	GEA WESTFALIA SEPARATOR GROUP GMBH	Germany	Services	Pro-Enrich
9	ANECOOP SOCIEDAD COOPERATIVA	Spain	Agriculture	Pro-Enrich
10	TAILORZYME APS	Denmark	Agriculture	Pro-Enrich

	Industrial Partner	Country	Sector	InnoRenew CoE Project
11	AGRO BUSINESS PARK AS	Denmark	Agriculture	Pro-Enrich
12	EMMELEV AS	Denmark	Chemical	Pro-Enrich
13	VERTECH GROUP	France	Consulting	Pro-Enrich
14	FRANKA MARZI	Slovenia	Food	Pro-Enrich
15	CHIMAR HELLAS AE	Greece	Wood	Pro-Enrich
16	EURIZON SL	Spain	Agriculture	Pro-Enrich
17	OLIVAR DE SEGURA	Spain	Food	Pro-Enrich
18	MARS GMBH	Germany	Food	Pro-Enrich
19	NATAC BIOTECH SL	Spain	Food	Pro-Enrich
20	G. C. HAHN AND COMPANY LIMITED	United Kingdom	Food	Pro-Enrich
21	SAHATEOLLISUUS RY	Finland	Wood	WoodCircus
22	ALFANATURA	Slovenia	Wood	WoodCircus
23	EGOIN SA	Spain	Wood	WoodCircus
24	VEOLIA PROPRE	France	Energy	WoodCircus
25	SAIB	Italy	Wood	WoodCircus
26	MOELVEN TOREBODA AB	Sweden	Wood	DynaTTB
27	MOELVEN LIMTRE AS	Norway	Wood	DynaTTB
28	SWECO NORGE AS	Norway	Chemical	DynaTTB
29	SMITH AND WALLWORK ENGINEERS LTD	United Kingdom	Construction	DynaTTB
30	GALEO	Spain	Construction	DynaTTB
31	EIFFAGE IMMOBILIER SUD OUEST	France	Services	DynaTTB
32	ARBONIS	France	Construction	DynaTTB
33	HYGIENE OFFICE	France	Biotechnology	CLICKdesign
34	JELOVICA	Slovenia	Wood	CLICKdesign
35	M SORA	Slovenia	Wood	Development of an application for harvesting timber 2.0
36	HEWLETT PACKARD ITALIANA SRL	Italy	ICT	PHArA-ON
37	CO-ROBOTICS SRL	Italy	ICT	PHArA-ON
38	ORTHOKEY ITALIA SRL	Italy	Health	PHArA-ON
39	MY ENERGIA ONER SL	Spain	Energy	PHArA-ON
40	ROBOTNIK AUTOMATION SLL	Spain	Robotics	PHArA-ON
41	INDRA SISTEMAS SA	Spain	Logistics	PHArA-ON
42	MAASTRICHT INSTRUMENTS	Netherlands	Technology	PHArA-ON
43	ADSYSCO BV	Netherlands	Consulting	PHArA-ON
44	ERICSSON NIKOLA TESLA D.D.	Croatia	ICT	PHArA-ON
45	ASCORA GMBH	Germany	ICT	PHArA-ON
46	INFORMATION CATALYST FOR ENTERPRISE LTD	United Kingdom	ICT	PHArA-ON
47	DOMALYS SAS	France	Consulting	PHArA-ON
48	GLINTT HEALTHCARE SOLUTIONS SA	Portugal	Consulting	PHArA-ON
49	SENLAB DOO	Slovenia	ICT	PHArA-ON
50	SENTAB ESTONIA OU	Estonia	ICT	PHArA-ON
51	ARHEL	Slovenia	Technology	Selective extraction of high value molecules from forest products processing residues in the speciality chemicals sector
52	KRONOSPAN TRADING SRL	Romania	Wood	Direct collaboration
53	RIKO HIŠE	Slovenia	Construction	Direct collaboration
54	FORTRADE	Slovenia	Furniture	Direct collaboration
55	INTEC MKD	Slovenia	Construction	Direct collaboration
56	PROFORM	Slovenia	Manufacturing	Direct collaboration
57	VUDEX	Slovenia	Manufacturing	Direct collaboration
58	NEUE HOLZBAU AG HERRN THOMAS STRAHM	Switzerland	Construction	Direct collaboration
59	MM DELTA	Slovenia	Investment	Direct collaboration
58	MARDOM PRO	Poland	Manufacturing	Direct collaboration
59	FENIKS	Poland	Manufacturing	Direct collaboration

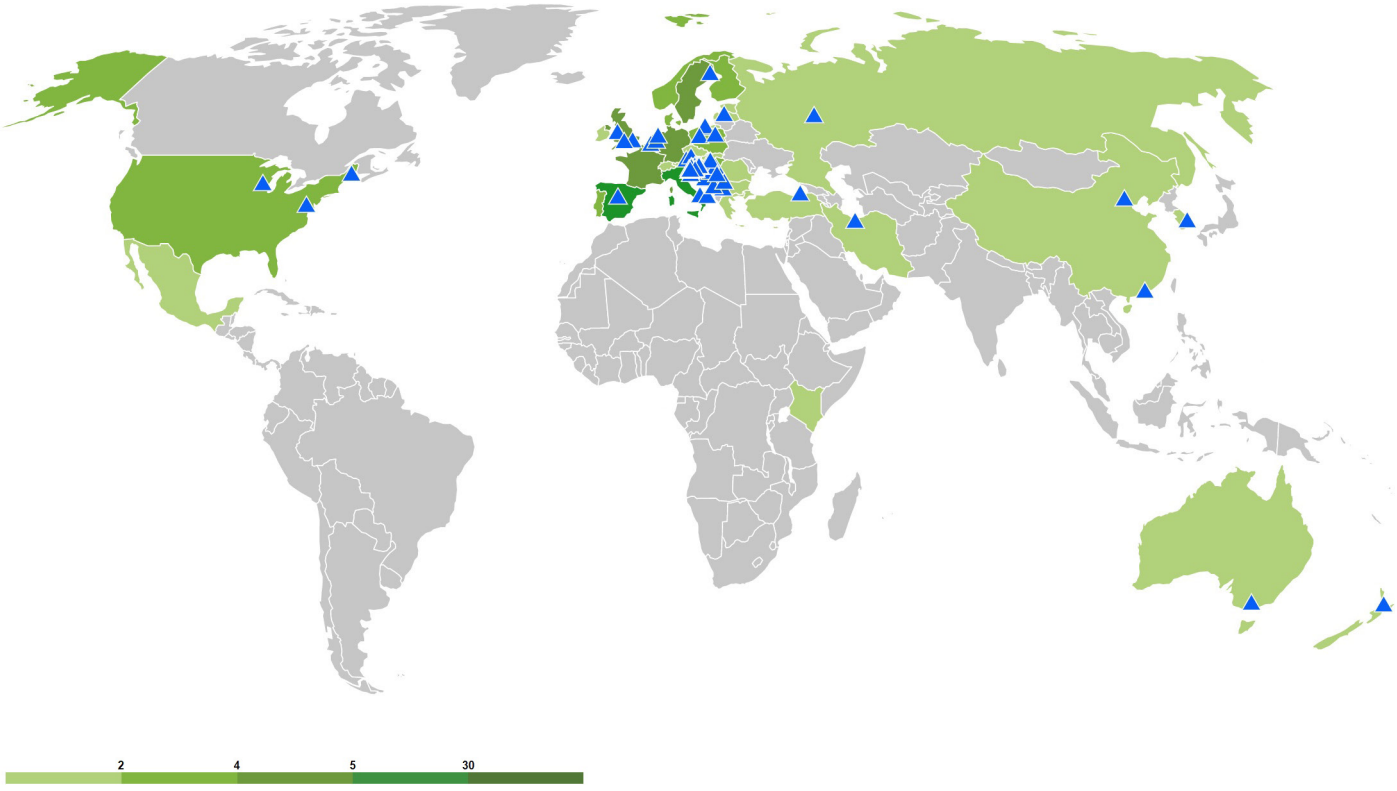
Living Lab InnoRenew
Živi laboratorij InnoRenew

In 2019, Living Lab InnoRenew acquired eight new members from three countries, bringing the total to 115 members from 28 countries (57 SMEs, 49 educational or research institutes, five regional development agencies and four individuals).

Living Lab InnoRenew offers activities and services according to membership status: gold, silver or associate. Currently, Living Lab InnoRenew has ten gold members, two silver members and 103 associates.

V letu 2019 je Živi laboratorij InnoRenew pridobil osem novih članov iz treh različnih držav; skupno ima trenutno 115 članov iz 28 držav. Od teh je 57 nacionalnih in mednarodnih malih in srednje velikih podjetij, 49 nacionalnih in mednarodnih izobraževalnih ustanov in raziskovalnih organizacij, pet regionalnih razvojnih agencij in štirje zainteresirani posamezniki.

Dejavnosti in storitve, ki jih ponuja živi laboratorij, se razlikujejo glede na status članov: zlato, srebrno ali pridruženo članstvo. Živi laboratorij InnoRenew ima trenutno deset zlatih članov, dva srebrna, drugi pa so pridruženi člani.



Locations of Living Lab InnoRenew members. Image: InnoRenew CoE
Lokcije, iz katerih so člani Živega laboratorija InnoRenew.. Foto: InnoRenew CoE

Table 8: Living Lab InnoRenew gold and silver members

Preglednica 8: Zlati in srebrni člani Živega laboratorija InnoRenew

Living Lab InnoRenew Gold Members	Country
University of Primorska	Slovenia
Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut WKI (Fraunhofer WKI)	Germany
University of Maribor	Slovenia
Institute for the Protection of Cultural Heritage of Slovenia	Slovenia
Slovenian National Building and Civil Engineering Institute	Slovenia
Pulp and Paper Institute	Slovenia
Zavod eOblak	Slovenia
National Institute of Public Health	Slovenia
Regional Development Agency of the Ljubljana Urban Region	Slovenia
Municipality of Izola	Slovenia
Living Lab InnoRenew Silver Members	**Country**
Feniks Zakład Produkcji Mebli Sp.zo.o.	Poland
Mardom Pro	Poland

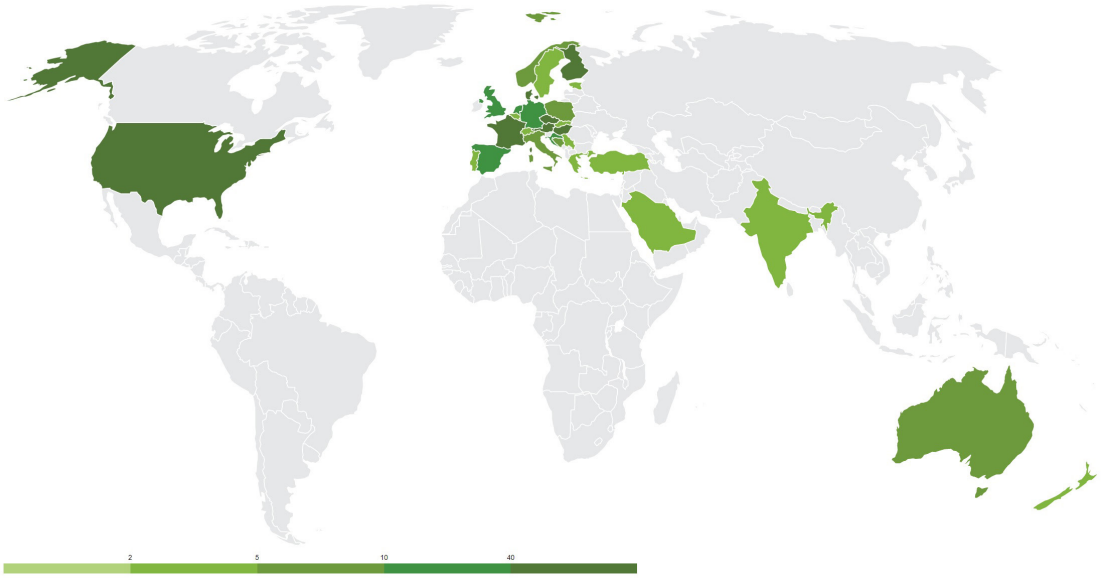
Living Lab InnoRenew gold and silver memberships. Image: InnoRenew CoE
Zlato in srebrno članstvo v Živem laboratoriju InnoRenew. Foto: InnoRenew CoE

Visitors

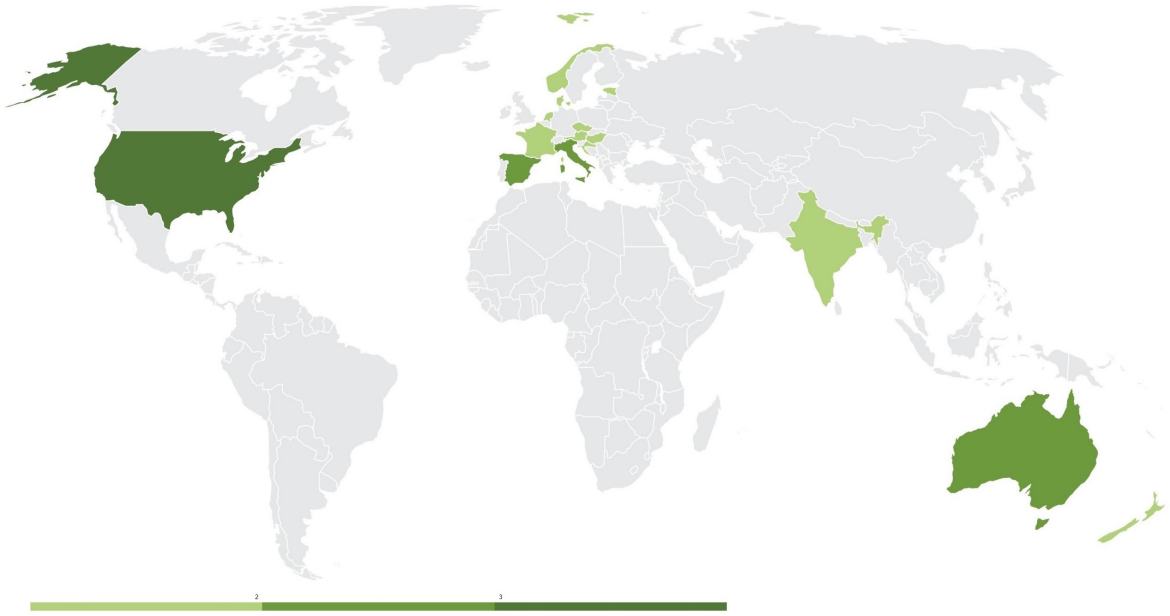
Obiskovalci

InnoRenew CoE hosted 155 international visitors in 2019 – 136 guests who were here for less than six days and 19 research visitors who were here for short term scientific missions, COST Actions and research projects. International visitors came from 30 countries, including multiple European countries, Australia, India, New Zealand, Saudi Arabia and the USA, where they hold professional posts in academia, research institutions and industry.

InnoRenew CoE je leta 2019 gostil 155 tujih obiskovalcev, od teh jih je bilo 136 na obisku manj kot šest dni, 19 obiskovalcev pa je – v okviru kratkoročnih znanstvenih obiskov, akcij COST ali raziskovalnih projektov – ostalo na inštitutu daljši čas. Tuji obiskovalci iz akademskega sveta, raziskovalno-razvojnih ustanov ali podjetij so prišli iz 30 različnih držav, med katerimi so številne evropske države, Avstralija, Indija, Nova Zelandija, Savdska Arabija in ZDA.



Home countries of guests hosted by InnoRenew CoE in 2019. Image: InnoRenew CoE
Države, iz katerih so prišli obiskovalci v letu 2019. Foto: InnoRenew CoE



Home countries of longer-term research visitors in 2019. Image: InnoRenew CoE
Dražve, iz katerih so prišli obiskovalci na daljši raziskovalni obisk v letu 2019. Foto: InnoRenew CoE

Table 9: InnoRenew CoE international visitors (1-5 days) in 2019

Preglednica 9: Tuji obiskovalci InnoRenew CoE (1–5 dni) v letu 2019

	InnoRenew CoE Guest	Affiliation	Country
61	Carlos Andrés García Velásquez	Maastricht University	Netherlands
62	Matin Rostamitabar	Maastricht University	Netherlands
63	Jan Tippner	Mendel University in Brno	Czech Republic
64	Andreas Weidenholzer	Metadynea	Austria
65	Wolfgang Kantner (visited 3 times)	Metadynea	Austria
66	Mariapaola Riggio	Oregon State University	USA
67	Arkadiusz Kawa	Poznań University of Economics and Business	Poland
68	Maximilian Pristovnik	Salzburg University of Applied Science, Forest Products Technology & Timber Construction	Austria
69	Dennis Jones	Self employeed	United Kingdom
70	Milan Vatovec	Simpson Gumpertz & Heger, Inc	USA
71	Veronika Kotradyova	Slovak University of Technology in Bratislava	Slovakia
72	Tiina M. Vainio-Kaila	South-Eastern Finland University of Applied Sciences	Finland
73	Rainer Bärs	Specim, Spectral Imaging Ltd	Finland
74	Duncan Mayes	Stora Enso	Finland
75	Pasi Kallio	Tampere University	Finland
76	Maren Molitor	Tate & Lyle	United Kingdom
77	Maestre Ferriz Rafael	Technological Centre of Furniture and Wood (CETEM)	Spain
78	Byron Truscott	Treibacher Industrie AG	Austria
79	Saqib Rasool Chaudhry	Unaffiliated	Saudi Arabia
80	Darija Gajić	University of Banja Luka	Bosnia and Herzegovina
81	Milica Malešević	University of Banja Luka	Bosnia and Herzegovina
82	Mladen Slijepčević	University of Banja Luka	Bosnia and Herzegovina
83	Slobodan Peulić	University of Banja Luka	Bosnia and Herzegovina
84	Nuno M. Garcia Dos Santos	University of Beira Interior	Portugal
85	Thomas Carreyre	University of Bordeaux	France
86	Adam Smith	University of Kansas	USA
87	Adam Ziegleo	University of Kansas	USA
88	Amenda Nelson	University of Kansas	USA
89	Andrew Moore	University of Kansas	USA
90	Anna Dierrs	University of Kansas	USA
91	Autumn King	University of Kansas	USA
92	Brett Floradl	University of Kansas	USA
93	Calwin Booman	University of Kansas	USA
94	Colin Sherman	University of Kansas	USA
95	Eleanor Revnzio	University of Kansas	USA
96	Emaad Gerami	University of Kansas	USA
97	Emily Hull	University of Kansas	USA
98	Emily Oades	University of Kansas	USA
99	Evlyn Swiby	University of Kansas	USA
100	Gavin Obert	University of Kansas	USA
101	Grant Henry	University of Kansas	USA
102	Hannah Steen	University of Kansas	USA
103	Igual Beeh	University of Kansas	USA
104	James Richey	University of Kansas	USA
105	Jennifer Harrison	University of Kansas	USA
106	John Hedeman	University of Kansas	USA

	InnoRenew CoE Guest	Affiliation	Country
107	Julia Doyle	University of Kansas	USA
108	Leah Ervin	University of Kansas	USA
109	Liz Moddsemog	University of Kansas	USA
110	Maggie Ziegler	University of Kansas	USA
111	Meagnan Boyd	University of Kansas	USA
112	Mia Schloegel	University of Kansas	USA
113	Phetf Phillips	University of Kansas	USA
114	Quentin Jamell	University of Kansas	USA
115	Reser Hall	University of Kansas	USA
116	Samuel Reing	University of Kansas	USA
117	Savanna Winterman	University of Kansas	USA
118	Tate Bensan	University of Kansas	USA
119	Thomas Reintyes	University of Kansas	USA
120	Zachon Pitter	University of Kansas	USA
121	Olga Martins De Brito	University of Luxembourg	Luxembourg
122	Rupert Wimmer	University of Natural Resources and Life Sciences (BOKU), Institute of Wood Technology and Renewable Materials	Austria
123	Ivan Lukovič	University of Novi Sad, Faculty of Technical Sciences	Serbia
124	Mátyás Báder	University of Sopron	Hungary
125	Fehér Sándor	University of Sopron, Faculty of Forestry, Institute of Wood Science	Hungary
126	Miklos Bak	University of Sopron, Faculty of Forestry, Institute of Wood Science	Hungary
127	Róbert Németh	University of Sopron, Faculty of Forestry, Institute of Wood Science	Hungary
128	András London	University of Szeged, Institute of Informatics	Hungary
129	Tamás Vinkó	University of Szeged, Institute of Informatics	Hungary
130	Andreji Novosel	University of Zagreb, Faculty of Forestry	Croatia
131	Bogoslav Šefc	University of Zagreb, Faculty of Forestry	Croatia
132	Vjekoslav Živković	University of Zagreb, Faculty of Forestry	Croatia
133	Mathilde Fiorletta	Vertech Group	France
134	Gabriel Ducos	VetAgro Sup	France
135	Patrick Pammer	Wood K plus	Austria
136	Maxime Forest	Yellow Window	France

Table 10: InnoRenew CoE international visitors (6+ days) in 2019

Preglednica 10: Tuji obiskovalci InnoRenew CoE (več kot 6 dni) v letu 2019

	InnoRenew CoE Research Visitor	Affiliation	Country	Period
1	René Alexander Herrera Díaz	University of the Basque Country	Spain	4/2/2019 - 1/2/2021
2	Franz Dolezal	IBO -- Austrian Institute for Building and Ecology	Austria	25/2/2019 - 8/3/2019
3	Nathan Kotlarewski	University of Tasmania	Australia	31/3/2019 - 20/4/2019
4	Marina Cocchi	University of Modena and Reggio Emilia	Italy	21/5/2019 - 28/5/2019
5	Joris Le Mélinaire	CESI	France	3/6/2019 - 20/9/2019
6	Sølvi Therese Strømmen Wie	Norwegian University of Life Sciences	Norway	18/6/2019 - 28/6/2019
7	Mislav Štepinac	University of Zagreb	Croatia	30/6/2019 - 30/9/2019
8	Jan Včelák	University Centre of Energy Efficient Buildings	Czech Republic	1/7/2019 - 24/12/2019
9	Estahel Naseri	Aalborg University Copenhagen	Denmark	1/7/2019 - 31/7/2019
10	Rami Hansen	Oregon State University	USA	1/7/2019 - 30/3/2019
11	Niko Hansen	University of Idaho	USA	1/7/2019 - 12/7/2019
12	Triinu Poltimäe	Tallinn University of Technology	Estonia	14/7/2019 - 26/7/2019
13	Oihana Gordobil Goñi	University of the Basque Country	Spain	5/8/2019 - 15/12/2019
14	Martina Vilhar	Impact Institute	Netherlands	15/8/2019 - 11/10/2019
15	Rosie Sargent	New Zealand Forest Research Institute Scion	New Zealand	1/9/2019 - 2/11/2019
16	Michelle Balasso	University of Tasmania	Australia	2/9/2019 - 13/9/2019
17	Vincenzo Rinaldi	University of L'Aquila	Italy	1/10/2019 - 31/12/2019
18	Robert Smith	Virginia Tech	USA	28/10/2019 - 20/11/2019
19	Chandra Bhakuni	Consultant	India	10/11/2019 - 6/12/2019

We asked our visitors about the reasons for their visit and impressions of the InnoRenew CoE.

Naše obiskovalce smo vprašali o razlogih njihovega obiska in vtistih o InnoRenew CoE.

Jan Včelák, University Centre of Energy Efficient Buildings, Czech Republic
July 1, 2019 – December 24, 2019

Why did you choose to come to InnoRenew CoE?
InnoRenew CoE is a new institute with high potential in the field of sustainable living and material research. As I was working in a similar field in UCEEB, I was very interested in the research at InnoRenew CoE and ideas which might come out of our mutual cooperation in terms of material, structure and environmental monitoring. Working with new people looking on the same things from different perspectives always brings new ideas and starts new collaboration.

How would you briefly describe your experience with us?
Friendly international diverse working environment where people are always keen to help whatever is needed. Emerging institute with open possibilities to do high-quality basic research in material science. Team is always willing to provide support to newcomers. Diverse projects with interesting topics, modern lab equipment and close collaboration with UPR gives a lot of possibilities and common knowledge and experience. It was really worth coming here, working on new ideas and establishing new relationships and collaboration.

Jan Včelák

Jan Včelák, Univerzitetni center za energetsko učinkovite stavbe (Univerzitní centrum energeticky efektivních budov – UCEEB), Češka (1. 7. 2019 – 24. 12. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
InnoRenew CoE je nov inštitut, ki na področju trajnostnega življenja in raziskav materialov veliko obeta. Ker sem v UCEEB delal na podobnem področju, so me zelo zanimale raziskave na InnoRenew CoE in ideje, ki bi jih lahko razvili z medsebojnim sodelovanjem na področju monitoringa materialov, konstrukcij in okolja. Delo z novimi ljudi, ki na iste stvari gledajo z drugačnih zornih kotov, vedno prinaša nove ideje in spodbuja nova sodelovanja.

Kako bi na kratko opisali svojo izkušnjo z nami?
Prijazno, mednarodno in raznoliko delovno okolje, kjer so ljudje vedno pripravljeni priskočiti na pomoč. Inštitut, ki je v vzponu in ima odprte možnosti za izvajanje visokokakovostnih temeljnih raziskav na področju znanosti o materialih. Ekipa je vedno pripravljena podpirati novince. Raznovrstni projekti z zanimivimi temami, moderna laboratorijska oprema in tesno sodelovanje z Univerzo na Primorskem nudijo veliko možnosti in splošnega znanja ter izkušenj. Res je bilo vredno priti sem, saj se ukvarjam z novimi idejami, navezujem nove odnose in začenjam nova sodelovanja.

Bob Smith, Virginia Tech College of Natural Resources and Environment, USA
October 28, 2019 – November 20, 2019

Why did you choose to come to InnoRenew CoE?
I have been very impressed with the forward-thinking research efforts the InnoRenew CoE is leading in Europe. As department head leading a program in sustainable biomaterials at Virginia Tech, we are trying to move our program in this new direction. Our foundation will always be based in wood science, but InnoRenew CoE is demonstrating the breadth of our discipline with its research, which is much more than traditional wood science. I hope to bring some of their ideas back to my department. We also led a program looking at the future of wood science education in Europe with institutions from eight EU countries looking at the future of our discipline. The needs of our students and industry partners in wood science are changing, and we must adapt our teaching/research efforts to better serve our constituents. It is our hope that the results of this meeting will help programs adjust to these changing needs.

How would you briefly describe your experience with us?
It has been a great learning experience for me. A better understanding of all the research that is being conducted here will open doors for future collaboration between our department and the InnoRenew CoE. If an opportunity arises, I would highly recommend other faculty to have this experience in this beautiful part of the world. I would like to thank everyone for this opportunity and look forward to future work together.


Bob Smith

Bob Smith, Visoka šola za naravne vire in okolje univerze Virginia Tech (Virginia Tech College of Natural Resources and Environment), ZDA (28. 10. 2019 – 20. 11. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Moderni raziskovalni pristopi, ki jih InnoRenew CoE prakticira v Evropi, so me zelo navdušili. Kot vodja oddelka, ki upravlja program na področju trajnostnih biomaterialov na Virginii Tech, se trudim naš program usmeriti na to novo pot. Naš temelj bo vedno lesarstvo, vendar InnoRenew CoE s svojim delom prikazuje obseg našega področja, ki je veliko širši od tradicionalno opredeljenega lesarstva. Upam, da bom nekatere njihove ideje prenesel na svoj oddelek. Pri nas smo vodili tudi program, pri katerem smo se skupaj z organizacijami iz osmih držav EU osredotočili na prihodnost izobraževanja na področju lesarstva. Potrebe naših študentov in industrijskih partnerjev v lesarstvu spreminjajo, zato moramo prilagoditi naš pristop k poučevanju in raziskovanju. Nadejamo se, da bodo rezultati tega srečanja k temu prispevali.

Kako bi na kratko opisali svojo izkušnjo z nami?
To je bila zame odlična učna izkušnja. Boljše razumevanje raziskav, ki se tu izvajajo, bo odprlo vrata prihodnjemu sodelovanju med našim oddelkom in InnoRenew CoE. Če se pojavi priložnost za tako izkušnjo, v tem čudovitem delu sveta, bi vsakemu toplo priporočal, da jo izkoristi. Rad bi se zahvalil vsem za to priložnost in veselim se prihodnjega sodelovanja.


Mátyás Báder

Mátyás Báder, University of Sopron, Hungary
February 18, 2019 – February 22, 2019

Why did you choose to come to InnoRenew CoE?
I found colleagues at the InnoRenew CoE with great knowledge and intention for cooperation.

How would you briefly describe your experience with us?
Great! Everybody was friendly and interested regarding me and my topics; I had a good time at InnoRenew CoE.

Mátyás Báder, Univerza v Šopronu (Soproni Egyetem), Madžarska (18. 2. 2019 – 22. 2. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Na InnoRenew CoE sem našel kolege z izjemnim znanjem in željo po sodelovanju.

Kako bi na kratko opisali svojo izkušnjo z nami?
Super! Vsi so bili zelo prijazni in so se zanimali zame in za moje raziskovalne teme; na InnoRenew CoE sem se imel res lepo.

Franz Dolezal, IBO – Austrian Institute for Building and Ecology, Austria
February 25, 2019 – March 8, 2019

Why did you choose to come to InnoRenew CoE?
InnoRenew CoE is a renowned research institute with its scope on renewable materials. This is, on one hand, a topic of high future concern but, on the other hand, also the focus of my home institution, IBO (Austrian Institute for Building and Ecology). So, I was very interested in the approach of InnoRenew CoE in comparison to IBO.

How would you briefly describe your experience with us?
InnoRenew CoE is a research institute dedicated to national and international research with great experience in several fields of research. This ensures their claim for a holistic, up-to-date approach and global leadership in the treated research topics. Furthermore, I have to state that I met a young, highly motivated team with the capability to push research forward as well as dissemination of results and teaching.

Franz Dolezal

Franz Dolezal, Avstrijski inštitut za gradbeništvo in ekologijo (Österreichisches Institut für Bauen und Ökologie – IBO), Avstrija (25. 2. 2019 – 8. 3. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
InnoRenew CoE je priznan raziskovalni inštitut na področju uporabe obnovljivih materialov. To je po eni strani področje prihodnosti, po drugi strani pa tudi fokus moje domače ustanove IBO (Avstrijski inštitut za gradbeništvo in ekologijo). Ravno zato me je zelo zanimalo, kakšni so pristopi v InnoRenew CoE v primerjavi z našimi.

Kako bi na kratko opisali svojo izkušnjo z nami?
InnoRenew CoE je raziskovalni inštitut, ki se ukvarja z nacionalnimi in mednarodnimi raziskavami in ima veliko izkušenj na različnih raziskovalnih področjih. To mu zagotavlja celovit, sodoben pristop in vodstveni položaj na področju obravnavanih raziskovalnih tem. Poleg tega moram povedati, da sem spoznal mlado, zelo motivirano ekipo, ki je sposobna spodbuditi raziskave ter razširiti znanje in rezultate.

Michelle Balasso

Michelle Balasso, University of Tasmania, Australia
September 2, 2019 – September 13, 2019

Why did you choose to come to InnoRenew CoE?
I decided to visit and do part of my PhD research at InnoRenew CoE as I felt inspired and compelled to engage in a fresh research environment dealing with wood modification and timber treatments. The InnoRenew CoE presented itself very well, and I immediately had positive responses and proposals of collaborations from the researchers working there.

How would you briefly describe your experience with us?
If briefly means a word, I would say fantastic. If it means a sentence, I would say it was one of the most fruitful and surprising experiences of my research. The friendly environment, the availability and support that I found, and the location all contributed to make my research visit such an awesome experience.

Michelle Balasso, Univerza v Tasmaniji (University of Tasmania), Avstralija (2. 9. 2019 – 13. 9. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Odločila sem se, da bom obiskala InnoRenew CoE in tu opravila del svojega doktorskega raziskovalnega dela, ker me je navdušilo delo v svežem in novem raziskovalnem okolju, ki se ukvarja z modifikacijo lesa in njegovo obdelavo. Ekipa InnoRenew se je zelo dobro predstavila in takoj sem dobila pozitivne odzive in predloge zaposlenih raziskovalcev za medsebojna sodelovanja.

Kako bi na kratko opisali svojo izkušnjo z nami?
Če »na kratko« pomeni z eno besedo, potem bi rekla: fantastično. Če pa pomeni v enem stavku, bi rekla, da je to bila ena najbolj plodnih in presenetljivih izkušenj, povezanih z mojim raziskovanjem. Prijazno okolje, razpoložljivost in podpora, ki sem jo dobila, ter lokacija. Vse to je prispevalo k temu, da je bil moj raziskovalni obisk tako super izkušnja.

Nathan Kotlarewski, University of Tasmania, Australia
March 31, 2019 – April 20, 2019

Why did you choose to come to InnoRenew CoE?
I decided to visit InnoRenew CoE because my colleagues from around the world had told me of the amazing research facilities available at this unique institute, which intrigued me as an early career researcher. I had also witnessed conference presentations and met a number of exciting and happy InnoRenew CoE employees at conferences who presented research of a similar nature to my research interests in timber product innovation.

How would you briefly describe your experience with us?
My experience at InnoRenew CoE in Koper, Slovenia was fantastic. **I FEEL** S**LOVE**NIA. The people are so friendly and an outstanding definition of a collegial research network with students and researchers where anything is achievable. As a visiting lecturer, I thoroughly enjoyed teaching the small group of students in a learning-by-making studio. It was an empowering experience to witness the students transform as they learned new research skills, used new tools for the first time, engaged in design-thinking to solve problems, refined new ideas and tested outcomes in a scientific manner. In addition, the Slovenian landscape was absolutely stunning; the historical towns and food were exceptional, and the experience is one that I will hold dear to me throughout my research career.

Nathan Kotlarewski

Nathan Kotlarewski, Univerza v Tasmaniji (University of Tasmania), Avstralija (31. 3. 2019 – 20. 4. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Za obisk InnoRenew CoE sem se odločil, ker sem od svojih kolegov z različnih koncev sveta slišal o neverjetnih raziskovalnih zmogljivostih, ki so na voljo na tem izjemnem inštitutu. Ker sem raziskovalec na začetku svoje kariere, mi je to vzbudilo veliko zanimanje. Prisostvoval sem tudi predstavitvam na konferencah in se srečal s številnimi zanimivimi in zadovoljnimi zaposlenimi na InnoRenew CoE. Predstavili so raziskave, ki se ujemajo z mojimi raziskovalnimi interesi na področju inovacij lesenih izdelkov.

Kako bi na kratko opisali svojo izkušnjo z nami?
Izkušnje z InnoRenew CoE v Kopru so bile fantastične. **I FEEL** S**LOVE**NIA. Ljudje so tako prijazni in so pravi pojem kolegialne raziskovalne mreže študentov in raziskovalcev, kjer je vse izvedljivo. Kot gostujoči predavatelj sem izjemno užival v poučevanju majhne skupine študentov, ki se je učila na podlagi prakse. Videti, kako se študentje spreminjajo, medtem ko se učijo novih raziskovalnih veščin, prvič uporabljajo nova orodja, sodelujejo pri oblikovalskem razmišljanju, da bi rešili probleme, pilijo nove ideje in znanstveno preverjajo rezultate, je bila spodbudna izkušnja. Poleg tega mi je bila slovenska pokrajina naravnost fantastična, zgodovinska mesta in hrana so bili izjemni, in izkušnja je taka, da mi bo ostala v ljubem spominu ves čas raziskovalne kariere.

Oihana Gordobil

Oihana Gordobil Goñi, University of the Basque Country, Spain August 5, 2019 – December 15, 2019

Why did you choose to come to InnoRenew CoE?
InnoRenew CoE is considered an innovative and multidisciplinary research institute that is focused on sustainable development through the processing of renewable materials.

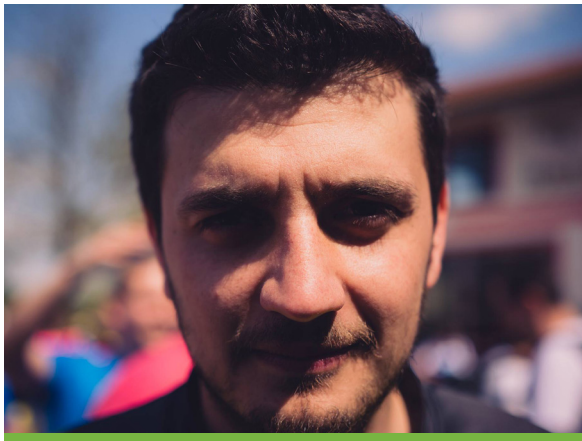
How would you briefly describe your experience with us?
My experience at InnoRenew CoE has been very enriching. Aside from gaining experience abroad and learning from experts, which has increased my research capacity, the people and the work environment has made me feel like at home.

Oihana Gordobil Goñi, Univerza v Baskiji (University of the Basque Country), Španija (5. 8. 2019 – 15. 12. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
InnoRenew CoE je inovativen in multidisciplinaren raziskovalni inštitut, ki je osredotočen na trajnostni razvoj na podlagi predelave obnovljivih materialov.

Kako bi na kratko opisali svojo izkušnjo z nami?
Izkušnja z InnoRenew CoE me je zelo obogatila. Poleg tega, da sem pridobila izkušnje v tujini in se učila od strokovnjakov, kar je povečalo moje raziskovalne zmogljivosti, so ljudje in delovno okolje ustvarili vzdušje, da sem se počutila kot doma.

Mislav Štepinac, University of Zagreb Faculty of Civil Engineering, Croatia
June 30, 2019 – September 30, 2019


Mislav Štepinac

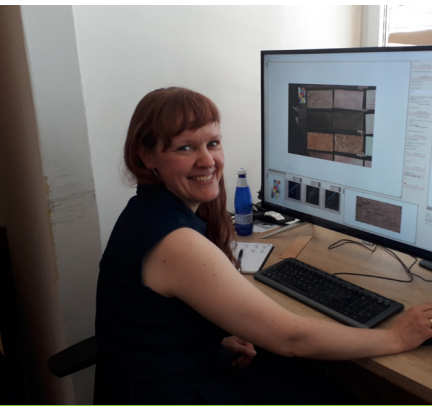
Why did you choose to come to InnoRenew CoE?
There are several reasons why I have chosen InnoRenew CoE. The first reason was to have an insight into a successful center of excellence and to collaborate with the team from InnoRenew CoE. As my topics are closely related to sustainable construction, design of sustainable structures and preservation of existing structures, I found it very interesting to collaborate with the team with great experience in these subjects. Also, I wanted to see how the new established institute has done so much in a just few years of existence and to learn from them how to apply for EU projects.

How would you briefly describe your experience with us?
Working with an international and interdisciplinary team at InnoRenew CoE literally opened my horizons. I was always a little bit skeptical how such a diverse team can work together, and my stay in Slovenia proved that I was completely wrong. My stay in Slovenia was absolutely great, from science to social activities. It was my pleasure to work with such a young team and to learn how to apply for projects and how to submit interdisciplinary project proposals. I hope I will collaborate with InnoRenew CoE much more in the future because I see great potential in the team as a whole and the work they are doing to reach the more sustainable and healthy environment.

Mislav Štepinac, Fakulteta za gradbeništvo Univerze v Zagrebu (Građevinski fakultet Sveučilišta u Zagrebu), Hrvaška (30. 6. 2019 – 30. 9. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Razlogov je več. Prvi razlog je dobiti vpogled v uspešen center odličnosti in sodelovati z ekipo InnoRenew CoE. Ker so moje teme tesno povezane s trajnostno gradnjo, načrtovanjem trajnostnih konstrukcij in konserviranjem obstoječih konstrukcij, se mi je zdelo zelo zanimivo sodelovati z ekipo, ki ima izjemne izkušnje na teh področjih. Poleg tega sem želel preveriti, kako je novoustanovljeni inštitut naredil toliko stvari v samo par letih obstoja, in se od njih naučiti, kako prijaviti projekte na razpise EU.

Kako bi na kratko opisali svojo izkušnjo z nami?
Delo z mednarodno in interdisciplinarno ekipo na InnoRenew CoE mi je resnično odprlo obzorja. Vedno sem bil malce skeptičen, kako lahko tako raznolika skupina deluje skupaj, med tem obiskom pa sem videl, da sem se krepko motil. Med obiskom v Sloveniji sem se na vseh področjih, od znanosti do družabnega življenja, odlično počutil. Bilo mi je v veselje delati s tako mlado ekipo in se učiti, kako prijaviti projekte in oddati predloge za interdisciplinarne projekte. Upam, da bom z InnoRenew CoE veliko sodeloval tudi v prihodnje, saj vidim velik potencial tako v ekipi kot v delu, ki ga opravljajo, da bi dosegli trajnostno in zdravo okolje.


Triinu Poltimäe

Triinu Poltimäe, Tallinn University of Technology, Estonia
July 14, 2019 – July 26, 2019

Why did you choose to come to InnoRenew CoE?
I had a previous collaboration with Dr. Anna Sandak and Dr. Jakub Sandak and, as they had joined InnoRenew CoE, I thought was a very good chance to visit the institute and continue an ongoing experiment.

How would you briefly describe your experience with us?
During my visit to InnoRenew CoE, I learned a lot and worked intensely on my experiments and managed to finish analyzing my samples.

Triinu Poltimäe, Tehniška univerza v Talinu (Tallinna Tehnikaülikooli – TalTech), Estonija (14. 7. 2019 – 26. 7. 2019)

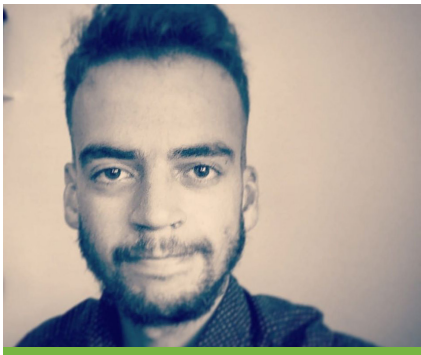
Zakaj ste se odločili obiskati InnoRenew CoE?
V preteklosti sem sodelovala z dr. Anno Sandak in dr. Jakubom Sandakom, in ko sta se pridružila InnoRenew CoE, sem pomislila, da je to idealna priložnost, da tudi sama obiščem inštitut in da nadaljujemo z začetim eksperimentom.

Kako bi na kratko opisali svojo izkušnjo z nami?
Med obiskom InnoRenew CoE sem se veliko naučila, intenzivno sem delala na svojih eksperimentih in uspela dokončati analizo svojih vzorcev.

Joris Le Mélinaire, CESI, France
June 3, 2019 – September 20, 2019

Why did you choose to come to InnoRenew CoE?
I chose InnoRenew CoE for many different points. For your location next to the sea, research project and environment of the institute.

How would you briefly describe your experience with us?
I liked my internship at InnoRenew CoE. Indeed, I met so many great people and my project was very interesting. I developed new skills in IOT and 3D printing. My office was next to the sea in a beautiful city. Now, after my engineering diploma, I would like to continue my studies in a PhD program. I keep very good memories from Slovenia and the InnoRenew CoE team. In summer I will be back, but this time only to chill.



Joris Le Mélinaire

Joris Le Mélinaire, CESI (Campus d'enseignement supérieur et de formation professionnelle – CESI), Francija (3. 6. 2019 – 20. 9. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Da sem izbral InnoRenew CoE, je bilo več različnih razlogov. Lokacija in bližina morja, raziskovalni projekti in okolje, v katerem deluje inštitut.

Kako bi na kratko opisali svojo izkušnjo z nami?
Praksa na InnoRenew CoE mi je bila zelo všeč. Vsekakor sem spoznal veliko čudovitih ljudi in tudi projekt, pri katerem sem delal, je bil zelo zanimiv. Naučil sem se veliko novega o IoT in 3D-tiskalniku. Moja pisarna je bila ob morju v prelepem mestnem jedru. Sedaj, po uspešno končanem študiju, bi rad nadaljeval z doktorskim študijem. Slovenija in ekipa InnoRenew CoE sta mi ostali v zelo lepem spominu. Vrnil se bom naslednje poletje, vendar tokrat na počitnice.

Rosie Sargent

Rosie Sargent, New Zealand Forest Research Institute Scion, New Zealand
September 1, 2019 – November 2, 2019

Why did you choose to come to InnoRenew CoE?
My organization is a Living Lab member, and Andreja and I have had a lot of discussions about research projects over the years. I was invited to come and work on a collaborative project, and it seemed like a great opportunity to do some work in a new area (wood densification), get to know people at InnoRenew CoE and see what work was going on.

How would you briefly describe your experience with us?
Everyone was really helpful and went out of their way to make sure I could get my work done. I learned a lot of new things and now have a better idea of the work that InnoRenew CoE is doing. And Koper is a really nice place to be based.

Rosie Sargent, Novozelandski inštitutu za raziskovanje gozdov Scion (New Zealand Forest Research Institute Scion), Nova Zelandija (1. 9. 2019 – 2. 11. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Moja organizacija je članica Živega laboratorija InnoRenew, poleg tega sva z Andrejo leta razpravljali o raziskovalnih projektih. Povabljena sem bila k sodelovanju pri skupnem projektu, kar se mi je zdela odlična priložnost, da nekaj naredim na novem področju (zgoščevanje lesa) in spoznam tako zaposlene na inštitutu InnoRenew CoE kot delo, ki se na inštitutu izvaja.

Kako bi na kratko opisali svojo izkušnjo z nami?
Vsi so mi bili pripravljeni pomagati in zelo so se trudili, da mi omogočijo opraviti svoje delo. Naučila sem se veliko novega in zdaj imam boljšo predstavo o delu, ki ga izvaja InnoRenew. Poleg tega je Koper res lepo mesto.

Marina Cocchi, University of Modena and Reggio Emilia, Italy
May 21, 2019 – May 28, 2019

Why did you choose to come to InnoRenew CoE?
I came in the framework of the Italy-Slovenia mobility project "Spectroscopy and multivariate data analysis for quality control of modified wood (MULTISPEC)", MAE SI18MO10.

How would you briefly describe your experience with us?
It has been a great pleasure being hosted by InnoRenew CoE, both from scientific and cultural/logistic points of view. During my stay, we set the basis for submitting an H2020 proposal. I had the opportunity to meet most of the researchers during the seminars I delivered and got nice questions and inspiring discussion. I visited the hyperspectral and analytical laboratories. I benefited from very efficient assistance with all practical issues. Finally, I have very good memories of coffee time at the Museum.

Marina Cocchi

Marina Cocchi, Univerza v Modeni in Reggiu Emilia (Università degli Studi di Modena e Reggio Emilia – UNIMORE), Italija (21. 5. 2019 – 28. 5. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Prišla sem v okviru projekta Spektroskopija in multivariatna analiza podatkov za nadzor kakovosti modificiranega lesa (MULTISPEC), ki omogoča mobilnost med Italijo in Slovenijo.

Kako bi na kratko opisali svojo izkušnjo z nami?
Zelo me je veselilo, tako z vidika znanosti kot kulture/narave, da so me gostili v InnoRenew CoE. V tem času smo postavili osnovo za prijavo projektnega predloga za razpis v okviru Obzorja 2020. Večino raziskovalcev sem imela priložnost srečati na seminarjih, na katerih sem predavala; postavljali so mi zanimiva vprašanja in spodbudili navdihujoče razprave. Obiskala sem hiperspektralne in analitične laboratorije. Zaradi učinkovite pomoči pri vseh izvedljivih zadevah sem veliko pridobila. In ne nazadnje: zelo lepe spomine imam na druženje ob kavi v Museumu.

Vincenzo Rinaldi

Vincenzo Rinaldi, University of L'Aquila, Italy
October 1, 2019 – December 31, 2019

Why did you choose to come to InnoRenew CoE?
The research investigates the behavior of timber structures subjected to seismic events. The results depend on studies carried out on a global scale on connections of steel to timber and the development of a reasonable numerical model. The experience of the researchers at InnoRenew CoE has been very helpful to achieve the goal of my PhD thesis.

How would you briefly describe your experience with us?
During my permanence in InnoRenew CoE, I had the possibility to work with experts in my field that were kind and available. Furthermore, I had the possibility to come in contact with students and researchers with different backgrounds in weekly meetings. This experience has been very nice.

Vincenzo Rinaldi, Univerza v Aquili (Università degli Studi dell'Aquila), Italija (1. 10. 2019 – 31. 12. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
Zanimajo me raziskave, ki preučujejo obnašanje lesenih konstrukcij pri potresu. Rezultati so seveda odvisni od globalnih raziskav o povezavi med jeklom in lesom ter razvoju ustreznega numeričnega modela. Izkušnje z raziskovalci z inštituta InnoRenew CoE so mi zelo pomagale pri doseganju cilja moje doktorske disertacije.

Kako bi na kratko opisali svojo izkušnjo z nami?
V času bivanja v Kopru in dela na inštitutu InnoRenew CoE sem imel možnost sodelovati s strokovnjaki z mojega področja, ki so bili prijazni in vedno na voljo. Poleg tega sem imel na tedenskih srečanjih možnost, da se družim s študenti in raziskovalci iz različnih okolij. To je bila zelo lepa izkušnja.

René Alexander Herrera Díaz, University of the Basque Country, Spain
February 4, 2019 – March 1, 2021

Why did you choose to come to InnoRenew CoE?
InnoRenew CoE is the perfect institute to gain research experience abroad in a multidisciplinary and friendly international environment.

How would you briefly describe your experience with us?
During this period, I have felt InnoRenew CoE as a big family, which tries to improve people's quality of life by interconnecting different areas of research, from human to material sciences. I am quite motivated to conduct my research here, where I have found lots of high-level researchers who not only are great in their specific areas but also great people in their own right. It has been an enriching experience as the center is in a constant process of knowledge transfer to all sectors of society.

René Alexander Herrera Díaz

René Alexander Herrera Díaz, Univerza v Baskiji (University of the Basque Country), Španija (4. 2. 2019 – 1. 2. 2021)

Zakaj ste se odločili obiskati InnoRenew CoE?
InnoRenew CoE je odličen inštitut za pridobivanje raziskovalnih izkušenj v tujini – v multidisciplinarnem in prijaznem mednarodnem okolju.

Kako bi na kratko opisali svojo izkušnjo z nami?
InnoRenew CoE sem ves čas doživljal kot veliko družino, ki skuša s povezovanjem različnih področij raziskav, od znanosti o človeku do znanosti o materialih, izboljšati kakovost življenja ljudi. Tukajšnje okolje, kjer sem našel veliko vrhunskih raziskovalcev, ki niso odlični le na svojih raziskovalnih področjih, ampak so tudi krasni ljudje, me je zelo spodbujalo k izvajanju mojih raziskav. Ta izkušnja me je obogatila, saj se v tem centru odličnosti nenehno odvija proces prenosa znanja na vsa področja družbe.

Martina Vilhar

Martina Vilhar, Impact Institute, Netherlands
August 15, 2019 – October 10, 2019

Why did you choose to come to InnoRenew CoE?
As a part of the Climate KIC Pioneers programme, I came to the InnoRenew CoE for a six-week placement. I chose the institute because I was curious about the ways this sector can contribute to creating further resilience to the climate crisis, and I had heard that there's an ambitious team of experts in sustainable construction. Besides, I was looking for an inspiring environment where I could learn and network.

How would you briefly describe your experience with us?
Apart from providing an inspiring learning environment, I felt very welcome and supported at the InnoRenew CoE from the first day. There's an amazing team spirit there, created by relaxed, enthusiastic, motivated, hard-working people, which makes being a guest at the InnoRenew CoE a unique experience. As they often host many researchers from all around the world, the InnoRenew CoE makes a great place for creating connections and, as well, friendships.

Martina Vilhar, Impact Institute, Nizozemska (15. 8. 2019 – 11. 10. 2019)

Zakaj ste se odločili obiskati InnoRenew CoE?
V InnoRenew CoE sem prišla na šesttedenski delovni obisk v okviru programa Climate-KIC Pioneers. Inštitut sem izbrala, ker me zanima, kako lahko ta sektor prispeva k večji odpornosti proti podnebnim spremembam, in ker sem slišala, da je tu ambiciozna skupina strokovnjakov za trajnostno gradnjo. Poleg tega sem iskala navdihujoče okolje, kjer bi se lahko učila in povezovala.

Kako bi na kratko opisali svojo izkušnjo z nami?
Ob tem, da mi je bilo zagotovljeno navdihujoče učno okolje, sem se v InnoRenew CoE že od prvega dneva počutila zelo dobrodošla in podprta. Tukaj je neverjeten timski duh, ki ga ustvarjajo sproščeni, navdušeni, motivirani in delavni ljudje, zaradi česar je biti gost v InnoRenew CoE edinstveno doživetje. Ker pogosto gostijo številne raziskovalce z vsega sveta, InnoRenew CoE ustvarja odličen prostor za povezovanja in tudi sklepanja prijateljstev.

Dissemination and outreach

Razširjanje rezultatov in obveščanje

Dissemination

In 2019, InnoRenew CoE employees attended and presented at 15 national conferences and 58 international conferences across Europe, North America, Australia and Africa.

Razširjanje rezultatov

V letu 2019 so se zaposleni v InnoRenew CoE udeležili 15 nacionalnih in 58 mednarodnih konferenc v številnih evropskih državah pa tudi v Severni Ameriki, Avstraliji in Afriki.

Table 11: National conference participation in 2019 by InnoRenew CoE employees

Preglednica 11: Udeležba zaposlenih na nacionalnih konferencah v letu 2019

	InnoRenew CoE Employee(s)	National Conference	Location	Date
1	Igor Gavrić, Iztok Šušteršič	Future Living	Ljubljana, Slovenia	11/2/2019
2	Ana Slavec	Statistic Day 2019	Ljubljana, Slovenia	12/2/2019
3	Miklós Krész	Discrete Biomathematics Afternoon at the Adriatic Coast 2019	Koper, Slovenia	13/2/2019
4	Andreja Kutnar	Boosting Innovation for EU Industry: Industrial Infrastructures and Open Innovation Ecosystems	Ljubljana, Slovenia	3/4/2019
5	Andreja Kutnar	Future Living	Ljubljana, Slovenia	11/4/2019
6	Miklós Krész, László Hajdu	Third Slovenia-Italy Research Day	Nova Gorica, Slovenia	16/4/2019
7	Aleš Oven	Valorisation conference CMEPIUS	Brdo pri Kranju, Slovenia	23/5/2019
8	Aleksandar Tosić, Kim Turk Mehes, Roberto Biloslavo	Day of innovation 2019, Connecting innovation -- why?	Brdo pri Kranju, Slovenia	25/9/2019
9	Jakub Sandak	25th Slovenian Science Festival	Ljubljana, Slovenia	26/9/2019
10	Črtomir Tavzes, Andreja Kutnar	Forest and wood as development opportunities for regional development	Kočevje, Slovenia	11/10/2019
11	Marica Mikuljan	Challenges in wood science 2019	Ljubljana, Slovenia	7/11/2019
12	Ana Slavec	Open Science: Conference on Open Research Data in Slovenia and Workshop for Researchers	Maribor, Slovenia	13/11/2019-15/11/2019
13	Balázs Dávid, Miklós Krész	46th International Annual Symposium DITP	Postojna, Slovenia	20/11/2019
14	Nežka Sajinčič	EDUvision 2019 Conference	Ljubljana, Slovenia	28/11/2019-30/11/2019
15	Ana Slavec	E-RIHS info day	Ljubljana, Slovenia	9/12/2019

Table 12: International conference participation in 2019 by InnoRenew CoE employees

Preglednica 12: Udeležba zaposlenih na mednarodnih konferencah v letu 2019

	InnoRenew CoE Employee(s)	International Conference	Location	Date
1	Iztok Šušteršič	Connected Smart Cities Conference 2019	Brussels, Belgium	17/1/2019
2	Laetitia Marrot	COST Action CA17107: European Network to connect research and innovation efforts on advanced Smart Textiles (conference)	Barcelona, Spain	29/1/2019-31/1/2019
3	Jakub Sandak	COST Action CA16215: European network for the promotion of portable, affordable and simple analytical platforms (management committee meeting)	Varaždin, Croatia	11/2/2019-15/2/2019
4	Michael Burnard, Anna Sandak	COST Action CA16226: Indoor living space improvement: Smart Habitat for the Elderly (core group, working group and management committee meetings)	Porto, Portugal	26/2/2019-1/3/2019
5	Michael Burnard	COST Action CA16114: REthinking Sustainability TOwards a Regenerative Economy (mid-term conference)	Bolzano, Italy	12/3/2019-16/3/2019

	InnoRenew CoE Employee(s)	International Conference	Location	Date
6	Laetitia Marrot, David B. DeVallance	JEC World 2019	Paris, France	12/3/2019-13/3/2019
7	Jaka Gašper Pečnik	Annual Rheology Conference (AERC 2019)	Portorož, Slovenia	8/4/2019-11/4/2019
8	Anna Sandak, Dean Lipovac	IRG50 Scientific Conference on Wood Protection	Quebec City, Canada	12/5/2019-16/5/2019
9	Balázs Dávid, Miklós Krész	2019 Hungarian Operations Research Society Conference	Szeged, Hungary	19/5/2019 - 23/5/2019
10	Michael Burnard, Barbara Rovere	Success factors of H2020 widening instruments in Slovakia: lessons learnt and future outlook	Žilina, Slovakia	19/5/2019-21/5/2019
11	Aleš Oven	Euraxess Conference 2019	Prague, Czech Republic	20/5/2019-23/5/2019
12	Kim Turk Mehes	ForestValue Research Programme Kick-Off Seminar	Helsinki, Finland	22/5/2019-24/5/2019
13	Črtomir Tavzes	Regional Challenges for European Forest-based Sector Coherence	Brašov, Romania	3/6/2019-5/6/2019
14	Nastja Podrekar	International Society of Behavioral Nutrition and Physical Activity 2019 Annual Meeting	Prague, Czech Republic	4/6/2019-7/6/2019
15	Kim Turk Mehes, Marica Mikuljan	FORESDA International Conference	Opatija, Croatia	4/6/2019
16	Jaka Pečnik, Václav Sebera	CompWood 2019	Växjö, Sweden	16/6/2019-22/6/2019
17	Miklós Krész	9th Slovenian International Conference on Graph Theory	Bled, Slovenia	23/6/2019-26/6/2019
18	David B. DeVallance	73rd Forest Products Society International Convention	Atlanta, Georgia (USA)	23/6/2019-29/6/2019
19	Roberto Biloslavo	European Academy of Management EURAM 2019: Exploring the Future of Management	Lisbon, Portugal	26/6/2019-28/6/2019
20	Balázs Dávid, László Hajdu, Črtomir Tavzes	XI Strucna konferencija drvoprerade, šumarstva, ekologije i enterijera „Ljudi, drvo, namještaj" 2019	Banja Luka, Bosnia and Herzegovina	27/6/2019-30/6/2019
21	Laetitia Marrot	4th International Conference on Natural Fibers	Porto, Portugal	30/6/2019-3/7/2019
22	Kim Turk Mehes	Systemic Design for Circular Policy-making: A Vision on EU Regions Policy Towards a Circular Economy	Brdo pri Kranju, Slovenia	3/7/2019
23	Miklós Krész	1st Conference on Transfer between Mathematics & Industry	Santiago de Compostela, Spain	22/7/2019-23/7/2019
24	Jakub Sandak	International Wood Machining Seminar	Corvallis, Oregon (USA)	25/8/2019-30/8/2019
25	Nastja Podrekar	Swiss Public Health Conference	Winterthur, Switzerland	27/8/2019-30/8/2019
26	Erwin M. Schau	9th International Conference on Life Cycle Management	Poznan, Poland	31/8/2019-5/9/2019
27	Kim Turk Mehes	Learning Lab Day	Thessaloniki, Greece	2/9/2019
28	Kim Turk Mehes	OpenLivingLab Days	Thessaloniki, Greece	3/9/2019-5/9/2019
29	Václav Sebera	4th International Scientific Conference: Wood Technology and Product Design	Ohrid, Macedonia	3/9/2019-8/9/2019
30	Anna Sandak, Jakub Sandak	NIR 2019	Gold Coast, Australia	15/9/2019-20/9/2019
31	Ana Slavec	16th Applied Statistics 2019	Bled, Slovenia	22/9/2019-24/9/2019
32	Michael Burnard	Drivers for Wood Construction	Joensuu, Finland	22/9/2019-26/9/2019
33	Aleš Oven, David B. DeVallance	European Association for International Education 2019	Helsinki, Finland	23/9/2019-28/9/2019

	InnoRenew CoE Employee(s)	International Conference	Location	Date
34	Andreja Kutnar, Iztok Šušteršič	European Research and Innovation Days	Brussels, Belgium	24/9/2019-26/9/2019
35	Elizabeth Ann Dickinson	Mediterranean Editors and Translators Meeting	Split, Croatia	25/9/2019
36	Anna Sandak	Healthy houses, healthy interior 2019, Identity sk	Bratislava, Slovakia	25/9/2019-29/9/2019
37	Dean Lipovac, Miklós Krész, Balázs Dávid, László Hajdu	15th International Symposium on Operations Research in Slovenia	Bled, Slovenia	25/9/2019-27/9/2019
38	Laetitia Marrot, Kim Turk Mehes, Erwin M. Schau	International Circular Packaging Conference	Ljubljana, Slovenia	27/9/2019
39	Iztok Šušteršič	Woodrise 2019	Quebec City, Canada	30/9/2019-4/10/2019
40	Kelly Peeters	Marcus Wallenberg Prize Event	Stockholm, Sweden	5/10/2019-10/10/2019
41	Anna Sandak	International Panel Products Symposium	Llandudno, United Kingdom	7/10/2019 - 10/10/2019
42	Aleksandar Tošić	SiKDD 2019 Conference on Data Mining and Data Warehouses	Ljubljana, Slovenia	7/10/2019
43	Aleksandar Tošić	Human-Computer Interaction in Information Society 2019	Ljubljana, Slovenia	9/10/2019
44	Anna Sandak, Nežka Sajinčič, Dean Lipovac	COST Action CA16226: Indoor living space improvement: Smart Habitat for the Elderly (scientific conference)	Ohrid, Macedonia	15/10/2019-18/10/2019
45	Aleš Oven	The engaged university. Linking the global and the local	Bled, Slovenia	17/10/2019-18/10/2019
46	Amy Simmons, David B. DeVallance, Elizabeth Ann Dickinson, Michael Burnard, Andreja Kutnar, Matthew Schwarzkopf	62nd Society of Wood Science and Technology International Convention	Fish Camp, California (USA)	20/10/2019-25/10/2019
47	Roberto Biloslavo	Academy of Management Specialized Conference: Responsible Leadership in Rising Economies	Bled, Slovenia	23/10/2019-25/10/2019
48	Ana Slavec	Research Data Alliance 14th Plenary	Helsinki, Finland	23/10/2019-25/10/2019
49	Elizabeth Ann Dickinson	ScienceWriters 2019	State College, Pennsylvania (USA)	25/10/2019-29/10/2019
50	László Hajdu	15th Miklós Iványi International PhD & DLA Symposium	Pécs, Hungary	27/10/2019-30/10/2019
51	Vesna Starman	Advancing Education: People, Institutions, Technology	Maribor, Slovenia	7/11/2019
52	Laetitia Marrot	7th Edition of the International Conference on Intelligent Textiles & Mass Customisation	Marrakech, Morocco	13/11/2019-15/11/2019
53	Kelly Peeters	WOODCHEM 2019	Nancy, France	19/11/2019-23/11/2019
54	Ana Slavec	European Open Science Cloud Symposium	Budapest, Hungary	26/11/2019-28/11/2019
55	Črtomir Tavzes, Andreja Kutnar	Forest-based Sector Technology Platform Annual Conference 2019: Launching the Strategic Research and Innovation Agenda 2030 of the European forest-based sector	Helsinki, Finland	26/11/2019-28/11/2019
56	Kim Turk Mehes	Bio-based Industries Joint Undertaking Stakeholder Forum 2019	Brussels, Belgium	4/12/2019
57	Iztok Šušteršič	25th Internationales Holzbau-Forum (IHF)	Innsbruck, Austria	4/12/2019-6/12/2019
58	Václav Sebera, Jaka Pečnik, Jakub Sandak, Nastja Podrekar	30th International Conference on Wood Science and Technology	Zagreb, Croatia	12/12/2019-13/12/2019

Outreach

InnoRenew CoE targets national and international audiences through multiple channels, including the institutional website (innorenew.eu), to keep the public informed about the institute's activities and results.

In 2019, a new type of content was developed. In addition to regular news, longer feature articles are shared each Wednesday on social media under #WednesdayRead and posted to special subsections of the website's news tab: Cross-section (long-form articles on InnoRenew CoE research and events), Others about us (interesting articles about InnoRenew CoE that were published in other media) and InnoRenew in person (in-depth interviews with InnoRenew CoE employees and visiting researchers).

Moreover, research results are published on Zenodo and links to scholarly articles are provided on the institute's website.

Website usage is monitored continuously, and analytics are gathered frequently. In 2019, the InnoRenew CoE website was visited 107598 times. Approximately 54 percent of users are from Slovenia and 46 percent are from other countries.

The InnoRenew CoE is active on social media, including Facebook, Twitter, LinkedIn and YouTube, and engagement numbers continue to grow. At the end of 2019, there were 1,332 likes on Facebook, 1,101 followers on Twitter and 319 followers on LinkedIn. The institute is using and uploading videos to its YouTube channel. Currently, there are 6 videos posted.

In 2019, InnoRenew CoE was featured in 153 national and international newspaper articles, 12 TV shows and 10 radio shows.

Obveščanje

InnoRenew CoE za obveščanje nacionalne in mednarodne javnosti o svojih dejavnostih in rezultatih uporablja številne kanale, vključno s svojo spletno stranjo (innorenew.eu).

V letu 2019 smo na tem področju razvili nove vsebine. Na družbenih omrežjih poleg rednih novic pod ključnikom #WednesdayRead vsako sredo delimo zanimiv daljši prispevek, objavljen na spletni strani InnoRenew CoE. Prispevki na spletni strani so vključeni v nove rubrike V preseku (poljudni daljši prispevki o raziskavah in drugih dejavnostih inštituta), Drugi o nas (zanimivi prispevki o raziskavah in dogodkih InnoRenew CoE, objavljeni v medijih) in InnoRenew osebno (intervjuji z zaposlenimi in gostujočimi raziskovalci).

Poleg tega so na spletni strani InnoRenew CoE objavljeni raziskovalni rezultati odprtega dostopa, ki so shranjeni tudi v repozitoriju Zenodo, in povezave do znanstvenih člankov raziskovalcev inštituta.

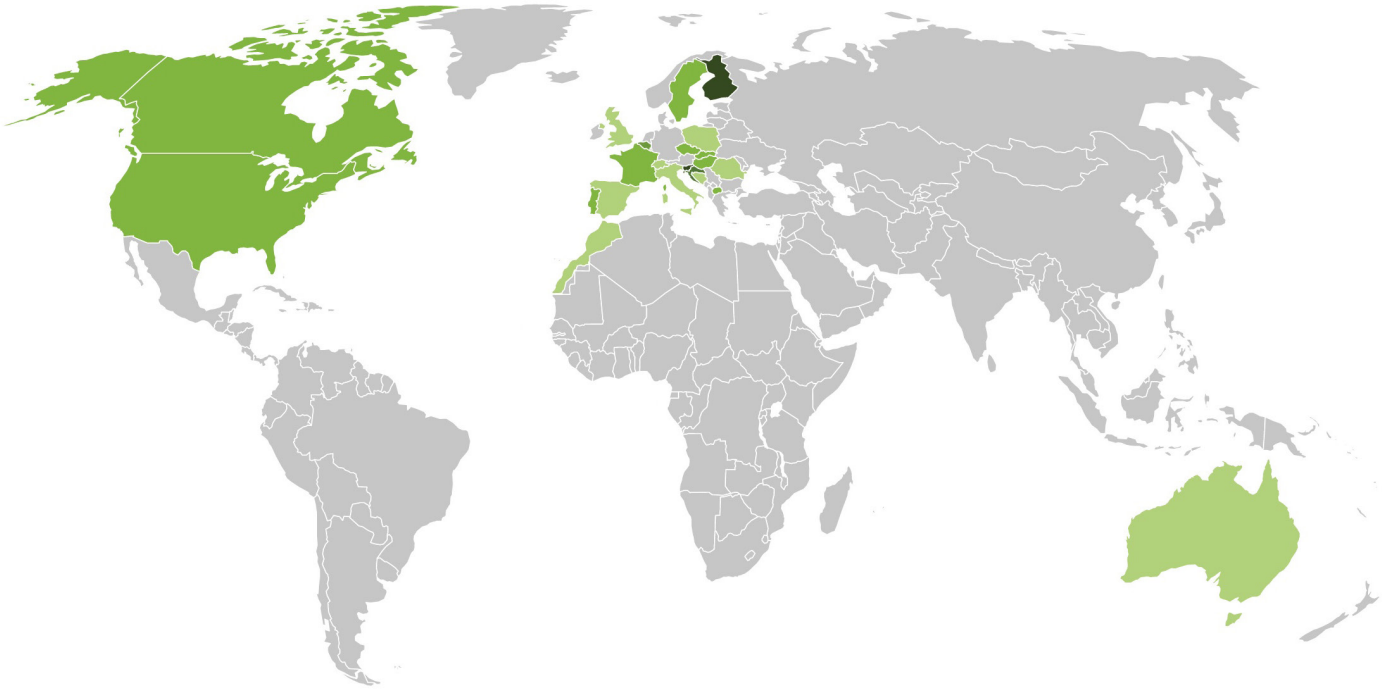
Obisk in aktivnosti spletne strani redno spremljamo z analitičnimi programi. Leta 2019 je bila obiskana 107598-krat. Približno 54 odstotkov vseh uporabnikov je iz Slovenije, 46 odstotkov pa iz ostalih držav sveta.

Dejavni smo tudi na naših spletnih družbenih omrežjih na Facebooku, Twitterju, LinkedInu in YouTubu, kjer se število aktivnih obiskovalcev in sledilcev še naprej povečuje. Na koncu leta 2019 smo zabeležili 1.332 všečkov na Facebooku ter 1101 sledilcev na Twitterju in 319 na LinkedInu. Za videoposnetke uporabljamo kanal na YouTubu, kjer je trenutno naloženih šest videoposnetkov.

V letu 2019 je bil InnoRenew CoE predstavljen in omenjen v 153 nacionalnih in mednarodnih časopisih in revijah, v 12 televizijskih programih in desetih radijskih oddajah.

Table 13: Outreach beyond scientific and professional communities in 2019 by the InnoRenew CoE
Preglednica 13: Obveščanje v letu 2019 (znanstvene in strokovne skupnosti niso vključene)

Dissemination Category	Activity	Quantity in December 2018	Quantity in December 2019
Social media	Facebook (likes)	1194	1332
	Twitter (followers)	1017	1101
	LinkedIn (followers)	130	319
Newspaper articles	National newspapers	75	140
	International newspapers	7	13 (Australia, Croatia, Denmark, Italy, Norway, USA)
TV shows	National	2	12
Radio shows	National	3	10



Countries of international conferences attended by InnoRenew CoE employees. Image: InnoRenew CoE
Države, kjer so potekale konference, ki so se jih udeležili zaposleni v InnoRenew CoE. Foto: InnoRenew CoE

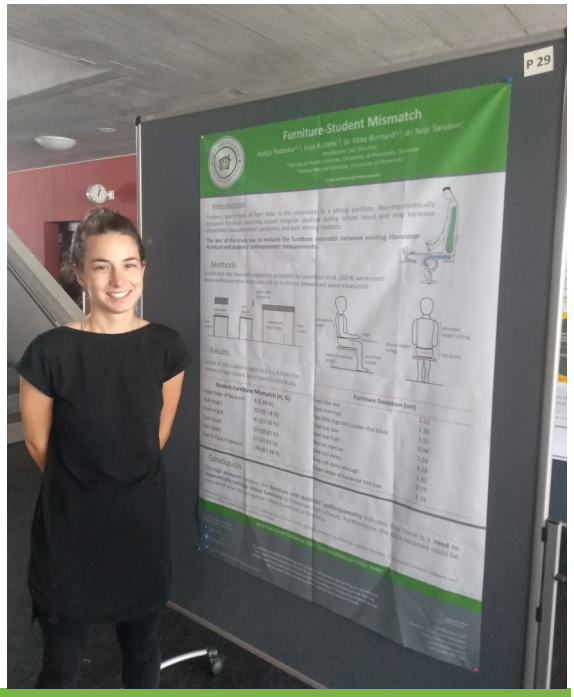
Signe Ratso deputy director general for the European Commission's Directorate General for Research, Technology and Innovation, Dr Andreja Kutnar and Magda de Carli, head of unit, for the European Commission's Directorate General for Research, Technology and Innovation at the 10th Week of Innovative Regions in Europe (WIRE X 2019) conference in Romania. Image: InnoRenew CoE / Signe Ratso, namestnica direktorja v Evropski komisiji za raziskave, tehnologijo in inovacije, dr. Andreja Kutnar in Magda de Carli, vodja oddelka za raziskave, tehnologijo in inovacije Evropske komisije, na konferenci Teden inovativnih evropskih regij v Evropi (WIRE X 2019) v Romuniji. Foto: InnoRenew CoE

Dr. David B. DeVallance at the 73rd Forest Products Society International Convention, Atlanta, Georgia (USA). Image: InnoRenew CoE / Dr. David B. DeVallance na 73. Mednarodnem zborovanju združenja Forest Products Society v Atlanti (Georgia, ZDA). Foto: InnoRenew CoE

Jaka Pecnik at the CompWood 2019 conference in Vaxjo, Sweden. Image: Václav Sebera. / Jaka Pečnik na konferenci CompWood 2019 v Växjöju (Švedska). Foto: Václav Sebera

Dr. Ana Slavec at the 16th Applied Statistics 2019 conference in Bled, Slovenia. Image: InnoRenew CoE / Dr. Ana Slavec na konferenci Uporabna statistika 2019 na Bledu (Slovenija). Foto: InnoRenew CoE

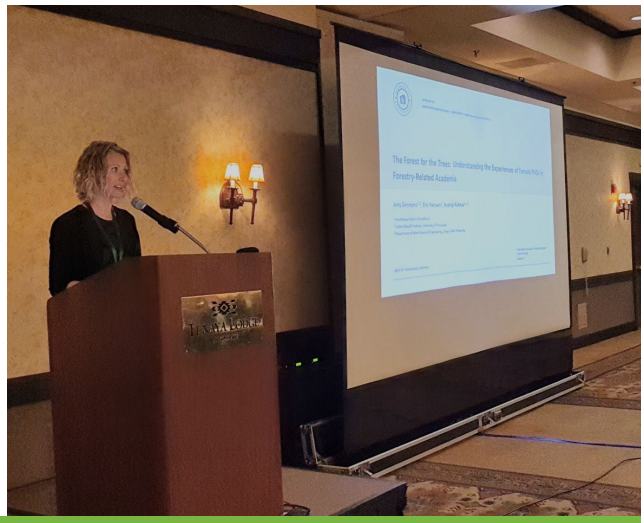
Dr. Iztok Sustersic at the Connected Smart Cities Conference 2019 in Brussels, Belgium. Image: InnoRenew CoE / Dr. Iztok Šušteršič na konferenci Povezana pametna mesta in skupnosti 2019 v Bruslju (Belgija). Foto: InnoRenew CoE



Nastja Podrekar at the Swiss Public Health Conference 2019 in Winterhur, Switzerland. Image: InnoRenew CoE / Nastja Podrekar na Švicarski konferenci o javnem zdravju v Winterthurju (Švica). Foto: InnoRenew CoE

Dr. Laetitia Marrot at the 4th International Conference on Natural Fibers in Porto, Portugal. Image: ICNF 2019 / Dr. Laetitia Marrot na 4. Mednarodni konferenci o naravnih vlaknih (ICNF 2019) – Pametne trajnostne rešitve v Portu (Portugalska). Foto: ICNF 2019

Dr. Laetitia Marrot, Dr. Erwin M. Schau and Kim Turk Mehes with mag. Mateja Mesl, director of the Pulp and Paper Institute, at the first International Circular Packaging Conference in Ljubljana, Slovenia.Image: InnoRenew CoE / Dr. Laetitia Marrot, dr. Erwin M. Schau in Kim Turk Mehes skupaj z direktorico Inštituta za celulozo in papir mag. Metejo Mešl na 1. Mednarodni konferenci o krožni embalaži v Ljubljani (Slovenija). Foto: InnoRenew CoE



Amy Simmons at the 62nd Society of Wood Science and Technology International Convention in Fish Camp, California (USA). Image: InnoRenew CoE / Amy Simmons na 62. Mednarodnem kongresu Združenja za znanost o lesu in tehnologijo v Fish Campu (Kalifornija, ZDA). Foto: InnoRenew CoE

Dr. Crtomir Tavzes at the Adriatic Wood Days conference in Dubrovnik, Croatia. Image: InnoRenew CoE / Dr. Črtomir Tavzes na konferenci Jadranski dnevi lesa v Dubrovniku (Hrvaška). Foto: InnoRenew CoE

Trainings, meetings and research visits

Izobraževanja, srečanja in raziskovalni obiski

Trainings

Personal and professional development is encouraged and fostered for all InnoRenew CoE employees. In 2019, employees participated in 21 national and international trainings.

Izobraževanja

Innorenew CoE svoje zaposlene podpira pri osebnem in poklicnem razvoju in jih k temu tudi spodbuja. V letu 2019 so zaposleni sodelovali na 21 nacionalnih in mednarodnih izobraževanjih in delavnicah.

Table 14: Trainings and workshops attended in 2019 by InnoRenew CoE employees

Preglednica 14: Izobraževanja, ki so se jih zaposleni v InnoRenew CoE udeležili v letu 2019

	InnoRenew CoE Employee(s)	Training	Location	Date
1	Jerneja Svanjak	Euraxess -- Researchers in Motion	Ljubljana, Slovenia	24/1/2019
2	Eva Prelovšek Niemelä	New work, engineering and urban legislation (ZUreP-2, GZ, ZAID)	Ljubljana, Slovenia	14/2/2019
3	Alijana Batič	Public procurement workshop	Ljubljana, Slovenia	26/3/2019
4	Črtomir Tavzes	How to build a successful incubator ecosystem in the alpine space? The power of networks	Baden-Württemberg, Germany	27/3/2019-28/3/2019
5	Črtomir Tavzes, Marica Mikuljan	Challenges and Opportunities of Eco-construction in Southeast Europe	Zagreb, Croatia	24/4/2019
6	Črtomir Tavzes	Bioeconomy and Bio-based Industry for the Rural Renaissance of Regions	Trieste, Italy	24/5/2019
7	Balázs Dávid	Advanced Process Optimization course	Lyngby, Denmark	2/6/2019-15/6/2019
8	Alijana Batič	Reporting workshop (Spremljanja in poročanja o izvajanju evropske kohezijske politike 2014-2020)	Ljubljana, Slovenia	13/6/2019
9	Jerneja Svanjak	Euraxess -- Researchers in Motion	Koper, Slovenia and Trieste, Italy	20/6/2019
10	Aleš Oven	Erasmus+ training	Amman, Jordan	5/7/2019-19/7/2019
11	Ana Slavec	Research Data Science Summer School (CODATA-RDA)	Trieste, Italy	5/8/2019-16/8/2019
12	Miklós Krész	Modern Approaches in Data Engineering and Information System Design (ADBIS conference workshop)	Bled, Slovenia	8/9/2019
13	Balázs Dávid	PRACE Autumn School 2019 -- Big Data and HPC	Ljubljana, Slovenia	17/9/2019 - 20/9/2019
14	Eva Prelovšek Niemelä	Contract about design and regulation about detailed content in building documentation	Ljubljana, Slovenia	25/9/2019
15	Václav Sebera, Amy Simmons, Miklós Krész, Jakub Sandak, Anna Sandak	First Slovene Plasma Day	Ljubljana, Slovenia	30/9/2019
16	David B. DeVallance	EU Research Proposals Delivering High Impact	Brussels, Belgium	14/10/2019-15/10/2019
	Nataša Škorja Djikanovič, Tamara Turk	Preparation for reporting in public sector	Ljubljana, Slovenia	22/11/2019
18	Alijana Batič	Funcionality of the public procurement portal, electronic exchange of order and verification of data in system e-Dosje and new portal eRevizija	Ljubljana, Slovenia	27/11/2019
19	Patricija Bembič	Novelties in tax (DDV) starting 1 January 2020	Ljubljana, Slovenia	16/12/2019
20	Ana Slavec	RDA node Slovenia	Ljubljana, Slovenia	16/12/2019
21	Patricija Bembič	Changes in income tax (DDPO) and tax procedure in 2020	Ljubljana, Slovenia	17/12/2019

Meetings

In 2019, InnoRenew CoE employees attended governance and board meetings in their capacity as leaders within professional societies and COST Actions. As active members, they also participated in research project meetings, COST Actions and standardization committees.

Srečanja

V letu 2019 so se zaposleni v InnoRenew CoE, ki zasedajo vodilna mesta v strokovnih združenjih in pri akcijah COST, udeleževali njihovih vodstvenih sestankov in sestankov upravnih odborov. Kot aktivni člani so sodelovali tudi na sestankih raziskovalnih projektov, akcij COST in odbora za standardizacijo.

Table 15: Meetings attended in 2019 by InnoRenew CoE employees

Preglednica 15: Srečanja, ki so se jih zaposleni v InnoRenew CoE udeležili v letu 2019

	InnoRenew CoE Employee(s)	Meeting	Location	Date
1	Michael Burnard, Kim Turk Mehes	WoodCircus project, workshop	Warsaw, Poland	30/1/2019-1/2/2019
2	Václav Sebera	Meeting and measurement with dr. Petr Klímek from TESCAN	Brno, Czech Republic	30/1/2019-1/2/2019
3	Václav Sebera	Day with Fulbright at Mendel University in Brno	Brno, Czech Republic	20/2/2019
4	Václav Sebera	Meeting and mesurement with representatives of Bruker	Aachen, Germany	07/03/19
5	Igor Gavrić	Standards Committee Building and Civil Engineering, CEN/TC 250/SC 8 -- Eurocode 8: Earthquake resistance design of structures	Oslo, Norway	11/3/2019-14/3/2019
6	Jakub Sandak, Manca Drobne	CLICKdesign project, kick-off meeting	Watford, United Kingdom	17/3/2019-20/3/2019
7	Črtomir Tavzes	46th European Forest-based Sector Technology Platform, advisory committee meeting	Brussels, Belgium	18/3/2019
8	Kim Turk Mehes, Michael Burnard	InnovaWood, 2019 general assembly meeting	Hamburg, Germany	26/3/2019-28/3/2019
9	Igor Gavrić, Iztok Šušteršič	DynaTTB project, kick-off meeting	Brumunddal, Norway	27/3/2019-30/3/2019
10	David B. DeVallance	ReMatSusBuilt project, meeting	Braunschweig, Germany	8/4/2019-9/4/2019
11	Manca Drobne	H2020 Coordinators' Day: Amendments / Reporting and Payments	Brussels, Belgium	10/4/2019-11/4/2019
12	Andreja Kutnar	International Society of Wood Science and Technology, board meeting	Asheville, North Carolina (USA)	17/4/2019-22/4/2019
13	David B. DeVallance	BRACKET project, second planning meeting	Yecla, Spain	5/5/2019-7/5/2019
14	Andreja Kutnar	Teaming Club meeting	Riga, Latvia	23/5/2019-24/5/2019
15	Matthew Schwarzkopf	Pro-Enrich project, general assembly meeting	Luebeck, Germany	23/5/2019-24/5/2019
16	Črtomir Tavzes	47th European Forest-based Sector Technology Platform, advisory committee meeting	Brašov, Romania	3/6/2019-5/6/2019
17	David B. DeVallance	Forest Products Society, board meeting	Atlanta, Georgia (USA)	23/6/2019-29/6/2019
18	Michael Burnard, Anna Sandak	COST Action CA16226: Indoor living space improvement Smart Habitat for the Elderly, core group/working group 4 meetings	Bucharest, Romania	24/6/2019-27/6/2019
19	Ana Slavec	EOSC FAIR WG meeting	Brussels, Belgium	3/7/2019-4/7/2019
20	Kim Turk Mehes, Michael Burnard	WoodCircus project, general assembly	Helsinki, Finland	6/7/2019-9/7/2019
21	Igor Gavrić, Iztok Šušteršič	Standards Committee Building and Civil Engineering: CEN/TC 250/SC 8, working group 3	Rome, Italy	12/9/2019-14/9/2019
22	Nežka Sajinčič	COST Action CA18236: Multi-disciplinary innovation for social change, first management committee meeting	Brussels, Belgium	2/10/2019-5/10/2019
23	Jakub Sandak	CLICKdesign project, meeting	Lund, Sweden	7/10/2019-9/10/2019

	InnoRenew CoE Employee(s)	Meeting	Location	Date
24	Črtomir Tavzes	48th European Forest-based Sector Technology Platform, advisory committee meeting	Brussels, Belgium	15/10/2019
25	Václav Sebera	Danube Region Project Meeting	Sopron, Hungary	17/10/2019-18/10/2019
26	Ana Slavec	RDA Europe Node Coordination Workshop	Helsinki, Finland	21/10/2019
27	Nežka Sajinčič, David B. DeVallance	BRACKET project, third transnational meeting	Larissa, Greece	6/11/2019-10/11/2019
28	Igor Gavrić, Iztok Šušteršič	ReMatSusBuilt project, workshop	Braunschweig, Germany	13/11/2019-16/11/2019
29	Veerapandian Ponnuchamy	COST Action CA18234: Computational materials sciences for efficient water splitting with nanocrystals from abundant elements	Brussels, Belgium	18/11/2019
30	David B. DeVallance	Uni-Adrion Region Round Table and Governing Board Meeting	Belgrade, Serbia	20/11/2019-21/11/2019
31	Anna Sandak, Jakub Sandak	CLICKdesign project, meeting	Ljubljana, Slovenia	21/11/2019
32	Anna Sandak, Jakub Sandak	Protection of bronze monuments in the changing environment project, meeting	Ljubljana, Slovenia	21/11/2019
33	Ana Slavec	EOSC FAIR WG meeting	Budapest, Hungary	25/11/2019
34	Michael Burnard, David B. DeVallance	ERC President visit to Slovenia – Meeting researchers	Ljubljana, Slovenia	28/11/2019
35	Michael Burnard	WoodCircus project, meeting	Munich, Germany	11/12/2019-12/12/2019
36	David B. DeVallance	AARC Scientific Committee Meeting	Trento, Italy	13/12/2019

Research visits

Eight InnoRenew CoE employees undertook research visits abroad during 2019, including four short term scientific missions, two training schools and two Erasmus+ exchanges.

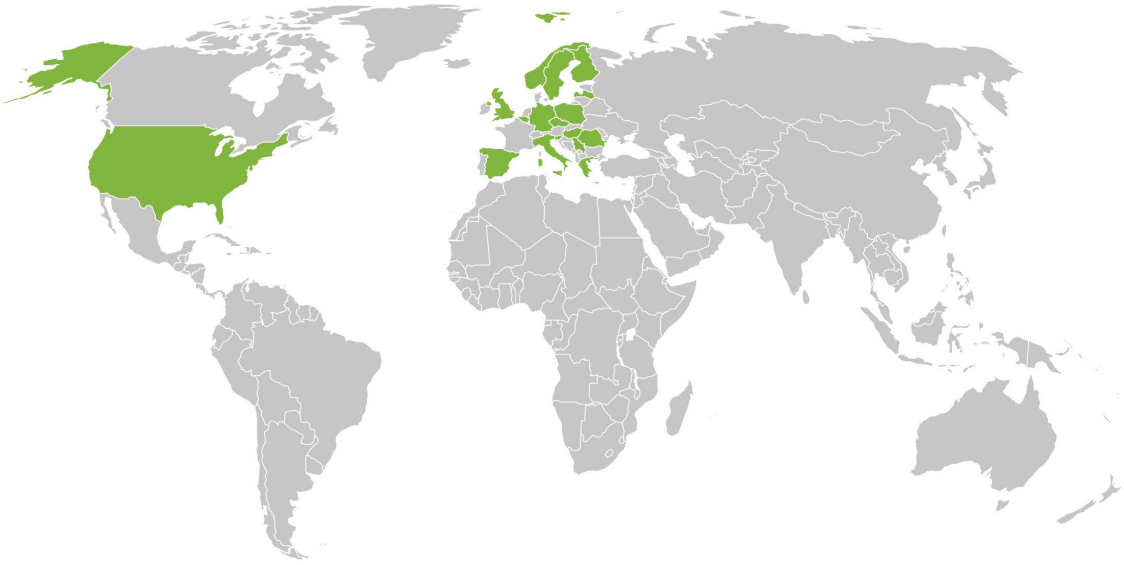
Raziskovalni obiski

V letu 2019 je raziskovalne obiske v tujini – štiri kratkoročne znanstvene obiske, dve šolanji, namenjeni usposabljanju, in dve izmenjavi Erasmus+ – opravilo osem zaposlenih v InnoRenew CoE.

Table 16: Research visits taken abroad in 2019 by InnoRenew CoE employees

Preglednica 16: Raziskovalni obiski, ki so jih zaposleni v InnoRenew CoE leta 2019 opravili v tujini

	InnoRenew CoE Employee	Type of Research Visit	Financing	Location	Date
1	Jakub Sandak	Short Term Scientific Mission	COST Action CA16215 European network for the promotion of portable affordable and simple analytical platforms	Tallinn, Estonia	3/2/2019-9/2/2019
2	Aleksandar Tošić	Training School	COST Action CA16226 Indoor living space improvement: Smart Habitat for the Elderly	Tallinn, Estonia	9/2/2019 - 15/2/2019
3	Kelly Peeters	Short Term Scientific Mission	COST Action FP1407 Understanding wood modification through an integrated scientific and environmental impact approach	Espoo, Finland	24/2/2019-2/3/2019
4	Dean Lipovac	Short Term Scientific Mission	COST Action CA16226 Indoor living space improvement: Smart Habitat for the Elderly	Ås, Norway	10/3/2019-23/3/2019
5	Laetitia Marrot	Short Term Scientific Mission	COST Action CA17107 European Network to connect research and innovation efforts on advanced Smart Textiles	Braunschweig, Germany	18/3/2019-7/4/2019
6	Barbara Rovere	Higher education student and staff mobility	Erasmus + KA103	Copenhagen, Denmark	16/8/2019-15/11/2019
7	Jaka Pečnik	Higher education student and staff mobility	Erasmus + KA103	Copenhagen, Denmark	4/9/2019-14/11/2019
8	Laetitia Marrot	Training School	COST Action CA17107: European Network to connect research and innovation efforts on advanced Smart Textiles	Rethymno, Greece	15/9/2019-21/9/2019



Countries of international meetings attended by InnoRenew CoE employees. Image: InnoRenew CoE
Države, kjer so potekale mednarodne delavnice, ki so se jih udeležili zaposleni v InnoRenew CoE. Foto: InnoRenew CoE

Dr. Črtomir Tavzes at the ESOF2020-sponsored bioeconomy workshop. Image: Črtomir Tavzes / Dr. Črtomir Tavzes na delavnici o bioekonomiji ESOF2020. Foto: Črtomir Tavzes

Dr. Michael Burnard at the H2020 workshop in Slovakia. Image: Barbara Rovere / Dr. Michael Burnard na seminarju o Obzorju 2020 na Slovaškem. Foto: Barbara Rovere

Journal
Revija

IPBE INTERDISCIPLINARY PERSPECTIVES on the BUILT ENVIRONMENT

Interdisciplinary Perspectives on the Built Environment

In 2019, the InnoRenew CoE took required first steps to establish *Interdisciplinary Perspectives on the Built Environment* (IPBE), an open access, peer-reviewed journal that aims to publish high-quality research at the nexus of sustainability, health and the built environment.

As IPBE's publisher, InnoRenew CoE submitted the journal to be registered with the Republic of Slovenia's Ministry of Culture. IPBE was approved and placed on the national media list in November 2019. This action will allow IPBE to publish for the first time in early 2020 as a special issue in conjunction with the annual InnoRenew CoE International Conference.

Revija Interdisciplinary Perspectives on the Built Environment

Leta 2019 je InnoRenew CoE naredil prve korake k ustanovitvi recenzirane revije (peer-reviewed journal) odprtega dostopa *Interdisciplinary Perspectives on the Built Environment* (IPBE). Revija bo predstavljala visokokakovostne raziskave na presečišču trajnostnosti, zdravja in grajenega okolja.

Revijo *IPBE* je InnoRenew CoE kot njen založnik prijavil v register na Ministrstvu za kulturo Republike Slovenije. Prijava je bila potrjena in *IPBE* je bil novembra 2019 vpisan v seznam nacionalnih medijev. Prva številka revije bo kot posebna izdaja, posvečena letni mednarodni konferenci InnoRenew CoE, izšla na začetku leta 2020.

Memberships and lecturing
Članstva in predavanja

Institutional

InnoRenew CoE holds organizational memberships in associations important to the institute's fields of research.

Članstva InnoRenew CoE

InnoRenew CoE je član združenj, ki so pomembna za raziskovalna področja inštituta.

Table 17: InnoRenew CoE institutional memberships
Preglednica 17: Članstva InnoRenew CoE v združenjih

	Organization	Membership	Term Begins	Term Ends
1	InnovaWood	Full	April 2017	ongoing
2	Forest Products Society	Bronze	October 2017	ongoing
3	European Forest Institute	Associate	December 2017	ongoing
4	EURAXESS -- Researchers in Motion	Contact Point	March 2018	ongoing
5	International Hemp Building Association	Member	October 2018	ongoing
6	Woodrise Alliance	Member	October 2018	ongoing
7	Slovenian Institute for Standarization	Member	March 2019	ongoing
8	Strategic Research and Innovation Partnership Smart Buildings and Home including Wood Chain	Member	September 2019	ongoing

COST Action

COST (European Cooperation in Science and Technology) Actions are an important and useful networking platform for InnoRenew CoE researchers. Currently, the institute has employees engaged in 13 thematically appropriate COST Actions.

Akcije COST

Za raziskovalce v InnoRenew CoE so akcije COST (European Cooperation in Science and Technology) zelo koristna in uporabna platforma. Zaposleni v InnoRenew CoE so trenutno vključeni v 13 tematsko ustreznih akcij COST.

Table 18: InnoRenew CoE COST Action involvement
Preglednica 18: Udeležba InnoRenew CoE v akcijah COST

	COST Action	InnoRenew CoE Member(s)
1	CA16226 Indoor living space improvement: Smart Habitat for the Elderly	Michael Burnard (MC member, vice chair) Jakub Sandak (MC substitute) Anna Sandak (MC member) Michael Mrissa (WG member) Dean Lipovac (WG member)
2	CA16114 REthinking Sustainability TOwards a Regenerative Economy	Michael Burnard (MC member, STSM coordinator/core group) Iztok Šušteršič (MC substitute)
3	CA16215 European network for the promotion of portable, affordable and simple analytical platforms	Michael Burnard (MC substitute) Jakub Sandak (MC member)
4	FP1407 Understanding wood modification through an integrated scientific and environmental impact approach	Andreja Kutnar (MC chair) Michael Burnard (MC member, WG4 vice leader/core group) Jakub Sandak (MC member) Anna Sandak (WG member) Amy Simmons (science communication manager) Matthew Schwarzkopf (general assembly member) Dean Lipovac (WG member) Jaka Gašper Pečnik (WG member)
5	FP1405 Active and intelligent fibre-based packaging - innovation and market introduction	Anna Sandak (WG member)
6	TU1403 Adaptive façades network	Anna Sandak (WG member)s

	COST Action	InnoRenew CoE Member(s)
7	CA15216 European Network of Bioadhesion Expertise: Fundamental Knowledge to Inspire Advanced Bonding Technologies	Anna Sandak (WG member)
8	CA17107 European Network to connect research and innovation efforts on advanced Smart Textiles	Laetitia Marrot (MC substitute)
9	CA18201 An integrated approach to conservation of threatened plants for the 21st Century	Amy Simmons (grant holder manager/administrator)
10	CA18234 Computational materials sciences for efficient water splitting with nanocrystals from abundant elements	Veerapandian Ponnuchamy (MC member, WG member)
11	CA18204 Dynamics of placemaking and digitization in Europe's cities	Ana Slavec (MC member), Tim Mavrič (MC substitute)
12	CA18236 Multi-disciplinary innovation for social change	Nežka Sajinčič (MC member)
13	CA 16228 European Network for Game Theory	Miklós Krész (WG member)

Individual

InnoRenew CoE employees are individual members of 44 national and international organizations.

Članstva zaposlenih v InnoRenew CoE

Zaposleni v InnoRenew CoE so člani 44 nacionalnih in mednarodnih združenj.

Table 19: InnoRenew CoE employee membership in international and national organizations
Preglednica 19: Članstva zaposlenih v InnoRenew CoE v mednarodnih in nacionalnih združenjih

	Organization	InnoRenew CoE Employee	Membership
1	Data Science meets Optimization (EURO Working Group)	Miklós Krész	Member
2	EOSC FAIR Working Group	Ana Slavec	Member
3	EU Environmental Footprint Technical Advisory Board; European Commission, Belgium	Erwin M. Schau	Member
4	European Association of International Education	David B. DeVallance	Member
5	European Chapter on Combinatorial Optimization (EURO Working Group)	Miklós Krész	Member
6	European Committee for Standardisation (CEN)	Igor Gavrić Iztok Šušteršič	Member Member
7	European Council of Doctoral Candidates and Junior Researchers (Eurodoc)	Ana Slavec	WG Open Science co-coordinator
8	European Mechanics Society, contact person for MENDELU	Václav Sebera	Member
9	Finnish Association of Architects (SAFA)	Aarne Johannes Niemelä	Member
10	Forest Products Society	Václav Sebera Matthew Schwarzkopf David B. DeVallance	Member Member Member, Immediate Past President
11	Forest Products Society, West Virginia University Student Chapter	David B. DeVallance	Advisor
12	Forest Technology Platform	Andreja Kutnar Črtomir Tavzes	Chairperson of National Support Group Slovenia Member of the Advisory Committee of the Forest-based sector
13	Green Building Council (GBC) Slovenia	Igor Gavrić	Member
14	Hungarian Operations Research Society	Balázs Dávid László Hajdu Miklós Krész	Member Member Secretary General, Board member (since 2017), Member
15	INCOSE - International Council on Systems Engineering	Erwin M. Schau	Member

	Organization	InnoRenew CoE Employee	Membership
16	InnovaWood	Andreja Kutnar	Executive Board
17	International Committee for Near Infrared Spectroscopy (ICNIRS)	Anna Sandak	Member of the Committee
		Jakub Sandak	Member of the Committee
18	International Research Group on Wood Protection (IRG)	Anna Sandak	Member of Communications Committee
		Dean Lipovac	Student member
19	International Society for Plant Spectroscopy (ISPS)	Anna Sandak	Member
20	International Society of Behavioral Nutrition and Physical Activity	Nastja Podrekar	Member
21	International Wood Machining Seminar (IWMS)	Jakub Sandak	Member of Advisory Committee
22	Italian Society for Near Infrared Spectroscopy (SISNIR)	Anna Sandak	Member
		Jakub Sandak	Member
23	IUFRO Officeholder	Anna Sandak	Deputy of division 5.03.05 – Biological resistance of wood
24	Mediterranean Editors and Translators	Elizabeth Dickinson	Member
25	National Museum for Architecture and Design	Barbara Rovere	Member of the Board
26	Network of Early-carrier Sustainable Scientists and Engineers (NESSE)	Anna Sandak	Member
27	Oregon State University	Amy Simmons	Faculty member
28	Public Body of the Hungarian Academy of Sciences	Miklós Krész	Member
29	Research Data Alliance	Ana Slavec	Individual member
30	Slovene Chamber of Architects (ZAPS)	Eva Prelovšek Niemelä	Member
31	Slovenian Acoustical Society	Rok Prislan	Member
32	Slovenian Association of Kinesiologists	Darjan Smajla	Member
33	Slovenian Association of Wood Science and Technology	Marica Mikuljan	Board member
34	Slovenian Chamber of Engineers/Inženirska zbornica Slovenije	Rudi Grahek	Member
35	Slovenian Discrete and Applied Mathematics Society	Miklós Krész	Member
36	Slovenian Institute for Standardisation (SIST)	Igor Gavrić	Member
		Iztok Šušteršič	Member
37	Slovenian Statistical Society	Ana Slavec	Member
38	Society of Wood Science and Technology	Andreja Kutnar	Board member, vice president from July 1, 2018
		David B. DeVallance	Committee Member on Emerging and Critical Issues and Past Chair of the Membership Committee
		Matthew Schwarzkopf	Member
		Jakub Sandak	Member
		Aarne Johannes Niemelä	Member
		Eva Prelovšek Niemelä	Member
		Václav Sebera	Member
		Michael Burnard	Member
		Amy Simmons	Member
39	Strateška Razvojna Inovacijska Partnerstva (SRIP)	Iztok Šušteršič	CoE representative and Head of timber construction group
40	VDI – The Association of German Engineers	Erwin M. Schau	Member
41	Wood and Fiber Science	Andreja Kutnar	Editorial Board
42	Young Academy of Europe	Andreja Kutnar	Member
43	Young Academy of Slovenia (Mlada akademija)	Ana Slavec	Management board member
44	Young Acousticians Network	Rok Prislan	Slovenia representative

Lecturing

In academic year 2018/2019, 19 InnoRenew CoE employees had teaching assignments at four higher education faculties.

Predavanja

V študijskem letu 2018/2019 je bilo 19 zaposlenih v InnoRenew CoE vključenih v pedagoško delo na štirih fakultetah.

Table 20: InnoRenew CoE employee teaching assignments for study year 2018/2019

Preglednica 20: Pedagoška dejavnost zaposlenih v InnoRenew CoE v študijskem letu 2018/2019

University	Faculty	InnoRenew CoE Employee	Academic Rank	Course(s) Taught
University of Primorska	Faculty of Mathematics, Natural Sciences and Information Technologies	Miklós Krész	Associate professor	Selected Topics in Theoretical Computer Science
		Aleksandar Tošić	Teaching assistant	Computer Science; Programming
		Igor Gavrić	Assistant	Wood Design and Structural Analysis
		Iztok Šušteršič	Assistant professor	Wood Design and Structural Analysis
		Ana Slavec	Assistant	Statistics
		Dean Lipovac	Assistant	Qualitative Research
		Matthew Schwarzkopf	Assistant professor	Wood Science and Technology
		Michael Burnard	Assistant professor	Data Science Ethics; Programming with R; Sustainable and Restorative Environments
		Michael Mrissa	Full professor	Selected Topics in Distributed Systems
		Balázs Dávid	Assistant	Formal Languages and Computability tutorial classes
		László Hajdu	Assistant	Programming 2
		Diego De Leo	Full professor	Selected Biopsychological Topics in English
		Nejc Šarabon	Full professor	Neurobiology of Physical/ Sports Activity 1, Neurobiology of Physical/Sports Activity 2
		Andreja Kutnar	Associate professor	Building Energy Simulation, Forest and Wood Management, Wood Science and Technology, Environmental Technology
	Faculty of Health Sciences	Nastja Podrekar	Assistant	Ergonomics
		Darjan Smajla	Assistant	Applied Biomechanics; Elite Sports Training
		Nejc Šarabon	Full professor	Project Reserach Work, Innovation and Development, Applied biomechanics, Modern perspectives in the applied kinesiology, Individual Research Work, Prevention and rehabilitation of upper limb in sport, Kinesiometrics, Gymnastics, Kinesiotherapy
	Faculty of Management	Roberto Biloslavo	Full professor	Strategic Management; Green Economy; Sustainable Management Practice
Rosenheim Technical University of Applied Sciences	Faculty of Wood Technology and Construction	Václav Sebera	Assistant professor	Advanced Technical Mechanics

Scientific communications

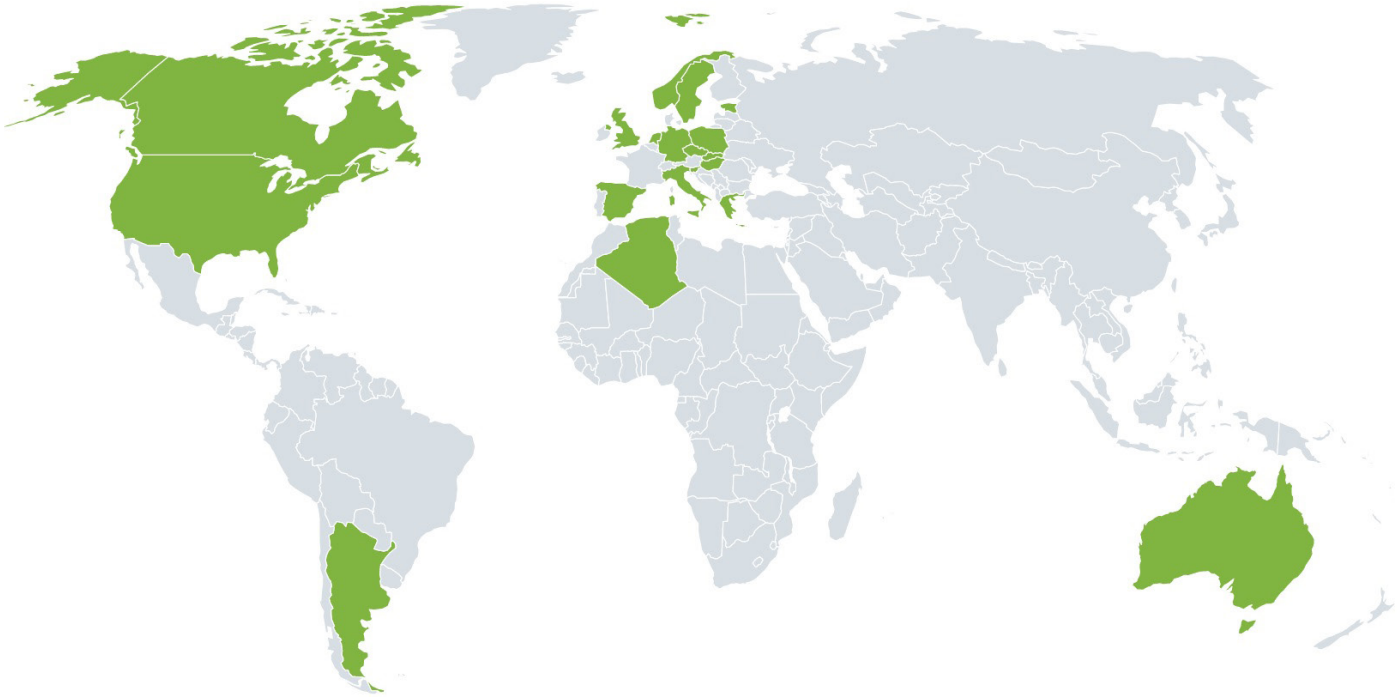
Znanstveno komuniciranje

InnoRenew CoE employees publish open access and make their publications available through the institute's Zenodo community.

In addition to scientific monograph *Bio-based Building Skin*, published by SpringerOpen, InnoRenew CoE researchers contributed 199 scientific communications in 2019 – 30 in SCI journals. Among these publications, 80 percent of SCI journal articles are published in collaboration with authors from abroad.

Zaposleni v InnoRenew CoE prispevke objavljajo v odprtem dostopu, shranjeni (in dostopni) pa so v spletni skupnosti inštituta v repozitoriju Zenodo.

Poleg znanstvene monografije *Bio-based Building Skin* (Stavbni ovoji iz materialov biotskega izvora), objavljene pri SpringerOpen, so raziskovalci InnoRenew CoE v letu 2019 prispevali 199 enot na področju znanstvenega komuniciranja, med katerimi je 30 člankov, ki so objavljeni v revijah s faktorjem vpliva (SCI journals). Osemdeset odstotkov teh člankov je nastalo v sodelovanju s tujimi avtorji.



Home countries of InnoRenew CoE coauthors. Image: InnoRenew CoE

Države, iz katerih so soavtorji člankov raziskovalcev InnoRenew CoE. Foto: InnoRenew CoE

1. VIDHOLDOVÁ, Zuzana, SANDAK, Anna Malgorzata, SANDAK, Jakub Michal. Assessment of the chemical change in heat treated pine wood by near infrared spectroscopy. Acta facultatis xylologiae Zvolen, ISSN 1336-3824, 2019, vol. 61, no. 1, str. 31-42.

2. KOO, Yu Wen, KÖLVES, Kairi, DE LEO, Diego. Profiles by suicide methods : an analysis of older adults. Aging & mental health, ISSN 1360-7863, 2019, vol. 23, no. 3, str. 385-391.

4. RASOULI, Nafee, MALAKOUTI, Seyed Kazem, REZAEIAN, Mohsen Rezaeian, SABERI, Seyed Mehdi, NOJOMI, Marzieh Molavi, DE LEO, Diego, RAMEZANI-FARANI, Abbas. Risk factors of suicide death based on psychological sutopsy method; a case-control study. Archives of academic medicine, ISSN 2645-4904, 2019, vol. 7, no. 1, str. 1-8.

5. KÖLVES, Kairi, ZHAO, Qing, ROSS, Victoria, HAWGOOD, Jacinta L., SPENCE, Susan H., DE LEO, Diego. Suicide and sudden death bereavement in Australia : a longitudinal study of family members over 2 years after death. Australian and New Zealand journal of psychiatry, ISSN 0004-8674, 2019, str. 1-10.

6. GOODFELLOW, Benjamin, KÖLVES, Kairi, DE LEO, Diego, SILVERMAN, Morton, BERMAN, Alan Lee, MANN, John J., ARENSMAN, Ella, HAWTON, Keith, PHILLIPS, Michael, VIJAYAKUMAR, Lakshmi. International study of definitions of English-language terms for suicidal behaviours : protocol of an opinion survey. BMJ open, ISSN 2044-6055, 2019, vol. 9, iss. 7, str. 1-6.

7. BURNARD, Michael David, KUTNAR, Andreja. Human stress responses in office-like environments with wood furniture. Building research and information, ISSN 0961-3218, 2019, str. 1-15.

8. SANDAK, Anna Malgorzata, SANDAK, Jakub Michal, MODZELEWSKA, Izabela. Manufacturing fit-for-purpose paper packaging containers with controlled biodegradation rate by optimizing addition of natural fillers. Cellulose, ISSN 0969-0239, 2019, vol. 26, iss. 4, str. 2673-2688.

9. SANDAK, Jakub Michal, RIGGIO, Mariapaola, RUGGIERI, Nicola, SANDAK, Anna Malgorzata. Damage progression analysis in a historical timber framed wall under cyclic loads through an image-based tracking method. Construction & building materials, ISSN 0950-0618. [Print ed.], 2019, vol. 199, str. 483-491.

10. GOODFELLOW, Benjamin, KÖLVES, Kairi, DE LEO, Diego. Contemporary nomenclatures of suicidal behaviors : a systematic literature review. Crisis, ISSN 0227-5910, 2019, str. 1-8.

11. RIMKEVICIENE, Jurgita, O'GORMAN, John, HAWGOOD, Jacinta L., DE LEO, Diego. Development and validity of the Personal Suicide Stigma Questionnaire (PSSQ). Crisis, ISSN 0227-5910, 2019, str. 1-9.

12. SANDAK, Jakub Michal, SANDAK, Anna Malgorzata, MARRAZZA, Stefano, PICCHI, Gianni. Development of a sensorized timber processor head prototype. Part 1 : sensors description and hardware integration. Croatian journal of forest engineering : [journal for theory and application of forestry engineering], ISSN 1845-5719, 2019, vol. 40, no. 1, str. 25-37.

13. BURNARD, Michael David, LEAVENGOOD, Scott, MUSZYŃSKI, Lech, GANIO, Lisa. Investigating face veneer check development in decorative plywood panel : the impact of four common manufacturing factors. European journal of wood and wood products, ISSN 0018-3768. [Print ed.], 2019, str. 1-19.

14. MYRONYCHEVA, Olena, POOHPHAJAI, Faksawat, SEHLSTEDT-PERSSON, Margot, VIKBERG, Tommy, KARLSSON, Olov, JUNGE, Helmut, SANDBERG, Dick. Application of GRAS compounds for the control of mould growth on scots pine sapwood surfaces : multivariate modelling of mould grade. Forests, ISSN 1999-4907, 2019, iss. 9, article 714, str. 1-16.

15. LOUGE, Thierry, HEDI KARRAY, Mohamed, ARCHIMÈDE, Bernard, MAAMAR, Zakaria, MRISSA, Michael. Semantic web services composition in the astrophysics domain : issues and solutions. Future generation computer systems, ISSN 0167-739X. [Print ed.], 2019, vol. 90, str. 185-197.

16. SMAJLA, Darjan, GARCÍA RAMOS, Amador, TOMAŽIN, Katja, STROJNIK, Vojko. Selective effect of static stretching, concentric contractions, and a one-leg balance task on ankle motion sense in young and older adults. Gait & posture, ISSN 1879-2219, 2019, vol. 71, 6 str.

17. SEBERA, Václav, REDON, Miguel, BRABEC, Martin, DĚCKÝ, David, ČERMÁK, Petr, TIPPNER, Jan, MILCH, Jaromír. Thermally modified (TM) beech wood : compression properties, fracture toughness and cohesive law in mode II obtained from the three-point end-notched flexure (3ENF) test. Holzforschung, ISSN 1437-434X. [Online ed.], 2019, vol. 73, iss. 7, str. 663-672.

18. PODREKAR, Nastja, KOZINC, Žiga, ŠARABON, Nejc. Effects of cycle and treadmill desks on energy expenditure and cardio-metabolic parameters in sedentary workers : review and meta-analysis. International journal of occupational safety and ergonomics, ISSN 1080-3548, [in press] 2019, str. 1-25.

19. SANDAK, Jakub Michal, GORBATSOVA, Jelena, SAAR-REISMAA, Piret, KALJURAND, Mihkel. Low-cost capillary electrophoresis instrumentation for assessment of rain water ionic composition. Inženjerstvo okoliša, ISSN 1849-4714, 2019, vol 6, no.1, str. 27-33.

20. GOODFELLOW, Benjamin, KÖLVES, Kairi, SELEFEN, Anne-Cécile, MASSAIN, Tiffany, AMADÉO, Stéphane, DE LEO, Diego. The WHO-START Study in New Caledonia : apsychological autopsy case series. Journal of affective disorders, ISSN 1573-2517, 2019, str. 1-7.

21. KÖLVES, Kairi, ZHAO, Qing, ROSS, Victoria, HAWGOOD, Jacinta L., SPENCE, Susan H., DE LEO, Diego. Suicide and other sudden death bereavement of immediate family members : an analysis of grief reactions six-months after death. Journal of affective disorders, ISSN 0165-0327. [Print ed.], 2019, vol. 243, str. 96-102.

22. GORJAN, Daša, BABIČ, Jan, ŠARABON, Nejc, POTOČANAC, Zrinka. Small, movement dependent perturbations substantially alter postural control strategy in healthy young adults. Journal of biomechanics, ISSN 0021-9290. [Print ed.], 2019, vol. 91, str. 1-6.

23. BARTHA, Miklós, KRÉSZ, Miklós Ferenz. On the König deficiency of zero-reducible graphs. Journal of combinatorial optimization, ISSN 1382-6905, 2019, str. 1-20.

24. PETRILLO, Marta, SANDAK, Jakub Michal, GROSSI, Paolo, SANDAK, Anna Malgorzata. Chemical and appearance changes of wood due to artificial weathering - dose-response model. Journal of near infrared spectroscopy, ISSN 0967-0335, 2019, vol. 27, iss. 1, str. 26-37.

25. ŠARABON, Nejc, KOZINC, Žiga, BABIČ, Jan, MARKOVIĆ, Goran. Effect of rowing ergometer compliance on biomechanical and physiological indicators during simulated 2,000-metre race. Journal of Sports Science and Medicine : free electronic journal, ISSN 1303-2968. [Online ed.], Jun. 2019, vol. 18, iss. 2, str. 264-270.

26. REYA, Matija, ŠKARABOT, Jakob, CVETIČANIN, Branko, ŠARABON, Nejc. Factors underlying bench press performance in elite competitive powerlifters. Journal of strength and conditioning research, ISSN 1064-8011, [in press], 9 str.

27. GOLUBIĆ, Antonija, ŠARABON, Nejc, MARKOVIĆ, Goran. Association between trunk muscle strength and static balance in older women. Journal of women & aging, ISSN 0895-2841, 2019, vol. , no. , str. 1-11.

28. KASTELIC, Kaja, ŠARABON, Nejc. Comparison of self-reported sedentary time on weekdays with an objective measure (activPAL). Measurement in physical education and exercise science, ISSN 1091-367X, Apr. 2019, vol. 23, iss. 3, str.227-236.

29. HAJDU, László, BÓTA, András, KRÉSZ, Miklós Ferenz, KHANI, Alireza, GARDNER, Lauren M. Discovering the hidden community structure of public transportation networks. Networks and spatial economics, ISSN 1566-113X, 2019, str. 1-23.

30. ROSS, Victoria, KÖLVES, Kairi, DE LEO, Diego. Exploring the support needs of people bereaved by suicide : a qualitative study. Omega, ISSN 0030-2228, 2019, str. 1-14.

31. DE LEO, Diego, BERARDINELLI, Manuela, SCARPINO, Osvaldo, TRABUCCHI, Marco. Loneliness in adolescents : a flash survey through amartphones. Open journal of medical psychology, ISSN 2165-9370, 2019, vol. 8, no. 3, str. 45-52.

32. ZAMPIERI, Sandra, ŠARABON, Nejc, LOEFLER, Stefan, HOFER, Christian, SAJER, Sascha, KABAS, Felix, CVECKA, Jan, SEDLIAK, Milan, KRENN, Mathias, HÜEBL, Wolfgang, KERN, Helmut. Cayenne pepper cataplasm "Munari" reduces pain and improves mobility in patients with non-specific chronic low back pain. Physical medicine and rehabilitation research, ISSN 2398-3353, Jun. 2019, vol. 4, iss. 2, str. 1-7.

33. ŠARABON, Nejc, MARUŠIČ, Jan, MARKOVIĆ, Goran, KOZINC, Žiga. Kinematic and electromyographic analysis of variations in Nordic hamstring exercise. PloS one, ISSN 1932-6203, 2019, vol. 14, no. 2, str. 1-16.

34. SMAJLA, Darjan, GARCÍA RAMOS, Amador, TOMAŽIN, Katja, STROJNIK, Vojko. Selective effect of static stretching, concentric contractions, and a balance task on ankle force sense. PloS one, ISSN 1932-6203, 2019, vol. 14, iss. 1.

35. ŠARABON, Nejc, KOZINC, Žiga, PODREKAR, Nastja. Using shear-wave elastography in skeletal muscle : a repeatability and reproducibility study on biceps femoris muscle. PloS one, ISSN 1932-6203, Aug. 2019, vol. 14, iss. 8, str. 1-13.

36. BILY, Walter, ŠARABON, Nejc, LOEFLER, Stefan, FRANZ, Carlo, WAKOLBINGER, Robert, KERN, Helmut. Relationship between strength parameters and functional performance tests in patients with severe knee osteoarthritis. PM & R :

The journal of injury, function and rehabilitation, ISSN 1934-1482, Aug. 2019, vol. 11, iss. 8, str. 834-842.

37. BABIČ, Jan, PETRIČ, Tadej, MOMBAUR, Katja, KINGMA, Idsart, BORNMANN, Jonas, GONZÁLEZ-VARGAS, José, BALTRUSCH, Saskla, ŠARABON, Nejc, HOUDIJK, Han. SPEXOR : design and development of passive spinal exoskeletal robot for low back pain prevention and vocational reintegration. SN Applied Sciences, ISSN 2523-3971, 2019, vol. 1, str. 262-1-262-5.

38. SMAJLA, Darjan, TOMAŽIN, Katja, STROJNIK, Vojko. Razlike v zaznavanju gibanja in položaja v gležnju med mlajšimi in starejšimi osebami. Šport : revija za teoretična in praktična vprašanja športa, ISSN 0353-7455, 2019, letn. 67, št. 3/4, str. 170-176.

39. PUSTIVŠEK, Suzana, ŠARABON, Nejc. Integral movement therapy versus local movement therapy approach in patients with idiopathic chronic low-back pain : study protocol for a randomized controlled trial. Trials, ISSN 1745-6215, 2019, vol. 20, no. 69, str. 1-7.

40. TIPPNER, Jan, PRAUS, Luděk, BRABEC, Martin, SEBERA, Václav, VOJÁČKOVÁ, Barbora, MILCH, Jaromír. Using 3D digital image correlation in an identification of defects of trees subjected to bending. Urban Forestry and Urban Greening, ISSN 1618-8667, 2019, vol. 46, str. 1-10.

41. OEXLE, Nathalie, NIEDERKROTENTHALER, Thomas, DE LEO, Diego. Emerging trends in suicide prevention research. Current opinion in psychiatry, ISSN 0951-7367, 2019, vol. 32, no. 4, str. 336-341.

42. VATOVEC, Rok, KOZINC, Žiga, ŠARABON, Nejc. Exercise interventions to prevent hamstring injuries in athletes : a systematic review and meta-analysis. European journal of sport science, ISSN 1746-1391, 2019, vol. , no. , str. 2-13.

43. DE LEO, Diego (sodelavec pri raziskavi), et al., GBD 2016 Neurology Collaborators. Global, regional, and national burden of neurological disorders, 1990-2016 : a systematic analysis for the Global Burden of Disease Study 2016. The Lancet neurology, ISSN 1474-4422, 2019, vol. 18, no. 5, str. 459-480.

44. POŠTUVAN, Vita, PODLOGAR, Tina, ŠEDIVY, Nuša, DE LEO, Diego. Suicidal behaviour among sexual-minority youth : a review of the role of acceptance and support. The Lancet, Child & adolescent health, ISSN 2352-4642, 2019, vol. 3, iss. 3, str. 190-198.

45. VIMPOLŠEK, Boštjan, JEREB, Borut, LERHER, Tone, KUTNAR, Andreja, LISEC, Andrej. Models for life cycle assessment : review of technical assumptions in collection and transportation processes. Tehnički vjesnik : znanstveno-stručni časopis tehničkih fakulteta Sveučilišta u Osijeku, ISSN 1330-3651, 2019, god.=Vol. 26, br.=no. 6, str. 1861-1868.

46. POHLEVEN, Jure, BURNARD, Michael David, KUTNAR, Andreja. Volatile organic compounds emitted from untreated and thermally modified wood - a review. Wood and fiber science, ISSN 0735-6161, 2019, iss. 3, vol. 51, str. 1-24.

Scientific monograph
Znanstvena monografija

1. SANDAK, Anna Malgorzata, SANDAK, Jakub Michal, BRZEZICKI, Marcin, KUTNAR, Andreja. Bio-based building skin, (Environmental footprints and eco-design of products and processes). Singapore: Springer Open, cop. 2019. XV, 183 str., ilustr. ISBN 978-981-13-3746-8. ISBN 978-981-13-3747-5.

Published scientific conference contribution
Objavljeni znanstveni prispevek na konferenci

1. KALLAB, Lara, CHBEIR, Richard, MRISSA, Michael. Automatic k-resources discovery for hybrid web connected environments. V: 2019 IEEE International Conference on Web Services (ICWS) ICWS 2019, 8-13 July 2019 Milan, Italy : proceedings. Los Alamitos: IEEE. cop. 2019, str. 146-153.

2. AZAMBUJA, Rafael, DEVALLANCE, David Brian, MCNEEL, Joseph, HASSLER, Curt. Comparison of nondestructive visual grading and proof loading systems on low-grade yellow-poplar lumber for CLT panel production. V: XIPING, Wang (ur.). 21st International Nondestructive Testing and Evaluation of Wood Symposium. proceedings : Freiburg, Germany, September 24-27, 2019. Madison: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 2019, str. 262-267.

3. MARROT, Laetitia Sarah Jennifer, VELLGUTH, N., WINKELMANN, J., WOLF, Marco, DEVALLANCE, David Brian. Introduction of biochar for the manufacture of flax conductive fabrics. V: Book of abstracts, 7th Edition of the International Conference on Intelligent Textiles & Mass Customisation November 13-15, 2019, Marrakesh, Morocco. [S. l.: s. n.]. 2019, str. 465-468.

4. JUTRAŽ, Anja, KUKEC, Andreja, OTOREPEC, Peter, LAMPIČ, Ladi, POHLEVEN, Jure, SANDAK, Jakub Michal, MALOVRH REBEC, Katja, VARKONJI, Monika. Monitoring environmental and health impact data in BIM models to assure healthy living environments. V: SOUSA, José (ur.), JOÃO, Pedro Xavier (ur.). eCAADe SIGraDi 2019 : proceedings of the 37th Conference on Education and Research in Computer Aided Architectural Design in Europe : the 23rd Conference of the Iberoamerican Society Digital Graphics, Porto, Portugal, 11th-13th Septemebr 2019. Vol. 2, Architecture in the Age of the 4th Industrial Revolution. 1st ed. Brussels: Education and Research in Computer Aided Architectural Design in Europe; Rio de Janeiro: Iberoamerican Society of Digital Graphics; Porto: Faculty of Architecture. cop. 2019, str. 287-294.

5. TOŠIĆ, Aleksandar, VIČIČ, Jernej, BURNARD, Michael David. Privacy preserving indoor location and fall detection system. V: BLAŽICA, Bojan (ur.), et al. Interakcija človek-računalnik v informacijski družbi : zbornik 22. Mednarodne multikonference Informacijska družba - IS 2019, 9. oktober 2019 :zvezek H = Human-Computer Interaction in Information Society : proceedings of the 22nd International Multiconference Information Society - IS 2019, 9 October, 2019, Ljubljana, Slovenia : volume H, (Informacijska družba, ISSN 2630-371X). Ljubljana: Institut "Jožef Stefan". 2019, str. 9-12.

6. MODERC, Gašper, TOŠIĆ, Aleksandar, VIČIČ, Jernej. In-game economy based on blockchain. V: BLAŽICA, Bojan (ur.), et al. Interakcija človek-računalnik v informacijski družbi : zbornik 22. Mednarodne multikonference Informacijska družba - IS 2019, 9. oktober 2019 : zvezek H = Human-Computer Interaction in Information Society : proceedings of the 22nd International Multiconference Information Society - IS 2019, 9 October, 2019, Ljubljana, Slovenia : volume H, (Informacijska družba, ISSN 2630-371X). Ljubljana: Institut "Jožef Stefan". 2019, str. 39-42.

7. ORŁOWSKI, Kazimierz A., CHUCHAŁA, Daniel, SANDAK, Jakub Michal. Effect on sawing accuracy of the lamella position. V: SCHAJER, Gary S. (ur.). IWMS-24 Proceedings, 24 International Wood Machining Seminar, August 25-30, 2019, Corvallis, Oregon. [S. l.: s. n.]. 2019, str. 47-52.

8. SANDAK, Jakub Michal, ORŁOWSKI, Kazimierz A., SANDAK, Anna Malgorzata, CHUCHAŁA, Daniel, TAUBE, Piotr. Vision system for on-line monitoring of wood surface roughness. V: SCHAJER, Gary S. (ur.). IWMS-24 Proceedings, 24 International Wood Machining Seminar, August 25-30, 2019, Corvallis, Oregon. [S. l.: s. n.]. 2019, str. 125-134.

9. TOŠIĆ, Aleksandar, VIČIČ, Jernej, MRISSA, Michael. A blockchain-based decentralizedself-balancing architecture for the webof things. V: WELZER-DRUŽOVEC, Tatjana (ur.), et al. New trends in databases and information systems : ADBIS 2019 Short Papers, Workshops BBIGAP, QAUCA, SemBDM, SIMPDA, M2P, MADEISD and Doctoral Consortium Bled, Slovenia, September, 8-11, 2019, : proceedings, (Communications in computer and information science (Internet), ISSN 1865-0937, 1064). Cham: Springer. cop. 2019, str. 325-336.

10. SANDAK, Jakub Michal, SANDAK, Anna Malgorzata, ZITEK, Andreas, HINTESTOISSER, Barbara, PICCHI, Gianni. From the lab to the field - development and evaluation of low-cost portable spectrometers for wood quality grading in forest. V: NIR 2019, 19th International Council of Near Infrared Spectroscopy Conference, Gold Coast Australia 15-20 September 2019. Indooroopilly: NIR Conference Secretariat, 2019, str. 1.

11. SANDAK, Anna Malgorzata, SANDAK, Jakub Michal, COCCHI, Marina. Multi-sensor and multi-way analysis of modified wood in service. V: NIR 2019, 19th International Council of Near Infrared Spectroscopy Conference, Gold Coast

Australia 15-20 September 2019. Indooroopilly: NIR Conference Secretariat, 2019, str. 1.

12. HERRERA DIAZ, Rene, LABIDI, Jalel, PONNUCHAMY, Veerapandian, SANDAK, Jakub Michal, SANDAK, Anna Malgorzata. Identification of the juvenile wood in sawn wood products by NIR spectroscopy and chemometrics. V: NIR 2019, 19th International Council of Near Infrared Spectroscopy Conference, Gold Coast Australia 15-20 September 2019. Indooroopilly: NIR Conference Secretariat, 2019, str. 1-2.

13. VAKE, Domen, TOŠIĆ, Aleksandar, VIČIČ, Jernej. Empirical study on the performance of Neuro Evolution of Augmenting Topologies (NEAT). V: MLADENIĆ, Dunja (ur.), GROBELNIK, Marko (ur.). Odkrivanje znanja in podatkovna skladišča - SiKDD : zbornik 22. Mednarodne multikonference Informacijska družba - IS 2019, 10. oktober 2019 : zvezek C = Data Mining and Data Warehouses - SiKDD : proceedings of the 22nd International Multiconference Information Society - IS 2019, 10 October, 2019, Ljubljana, Slovenia : volume C, (Informacijska družba, ISSN 2630-371X). Ljubljana: Institut "Jožef Stefan". 2019, str. 61-64.

14. SCHAU, Erwin Andreas Meissner, SANDAK, Anna Malgorzata, SANDAK, Jakub Michal, ROSS GOBAKKEN, Lone. Negative carbon footprint of packaging paper products, is it possible?. V: KARLOVITS, Igor (ur.). Proceedings of the 1st International Conference on Circular Packaging, Ljubljana, 26th and 27th September 2019. Ljubljana: Pulp and Paper Institute; Slovenj Gradec: Faculty of Polymer Technology. 2019, str. 137-150.

15. SCHAU, Erwin Andreas Meissner. Product Environmental Footprint (PEF) Category Rules (PEFCR) for intermediate paper products - overview and discussion of important choices made in the development. V: KARLOVITS, Igor (ur.). Proceedings of the 1st International Conference on Circular Packaging, Ljubljana, 26th and 27th September 2019. Ljubljana: Pulp and Paper Institute; Slovenj Gradec: Faculty of Polymer Technology. 2019, str. 175-183.

16. PINTÉR, Máté, DÁVID, Balázs. A two-stage heuristic for the university course timetabling problem. V: FISTER, Iztok (ur.), et al. Proceedings of the 2019 6th Student Computer Science Research Conference - StuCoSReC. Koper: University of Primorska Press. 2019, str. 27-30.

17. TIPPNER, Jan, KLOIBER, Michal, HRIVNÁK, Jaroslav, ZLÁMAL, Jan, SEBERA, Václav. Comparison of acoustic non-destructive methods and semi destructive methods for logs and timber assessment. V: LEVAN-GREEN, Susan L. (ur.). Proceedings of the 62nd International Convention of Society of Wood Science and Technology, October 20-25, 2019, Yosemite, California USA, 62nd International Convention of Society of Wood Science and Technology October 20-25, 2019, Yosemite, California USA. Yosemite: [s. n.]. 2019, str. 309-316.

18. SANDAK, Anna Malgorzata, SANDAK, Jakub Michal. Service life performance of bio-based composites. V: SPEAR, Morwenna (ur.). Proceedings of the International Panel Products Symposium 2019 : Llandudno, Wales, 8-9 October 2019. Bangor: BioComposites Centre. 2019, str. 113-120.

19. SAJINČIČ, Nežka, ISTENIČ STARČIČ, Andreja, SANDAK, Anna Malgorzata. Reverse mentoring as an alternative strategy for lifelong learning in the workplace. V: MAESTRE, Rafael (ur.), BURNARD, Michael David (ur.). Proceedings of the second COST Action CA16226 conference meeting, Ohrid, North Macedonia, 17th October 2019. [S. l.: s. n.]. 2019, str. 81-83.

20. LIPOVAC, Dean, BURNARD, Michael David. Choice architecture to promote the adoption of new technologies. V: MAESTRE, Rafael (ur.), BURNARD, Michael David (ur.). Proceedings of the second COST Action CA16226 conference meeting, Ohrid, North Macedonia, 17th October 2019. [S. l.: s. n.]. 2019, str. 107-109.

21. CYMER, Radoslaw, KRÉSZ, Miklós Ferenz. On the complexity of a filtering problem for constraint programming : decomposition by the structure of perfect matchings. V: ZADNIK STIRN, Lidija (ur.), et al. SOR '19 proceedings. Ljubljana: Slovenian Society Informatika, Section for Operational Research. 2019, str. 94-100.

22. LIPOVAC, Dean, HAJDU, László, STRØMMEN WIE, Sølvi Therese, NYRUD, Anders Q. Minimizing human stress in social networks with targeted interventions. V: ZADNIK STIRN, Lidija (ur.), et al. SOR '19 proceedings. Ljubljana: Slovenian Society Informatika, Section for Operational Research. 2019, str. 199-204.

23. DÁVID, Balázs. A tabu search method for optimizing : heterogeneous structural frame. V: ZADNIK STIRN, Lidija (ur.), et al. SOR '19 proceedings. Ljubljana: Slovenian Society Informatika, Section for Operational Research. 2019, str. 481-486.

24. SEBERA, Václav, PEČNIK, Jaka Gašper, AZINOVIĆ, Boris, KRAMAR, Miha. Numerical modeling of wood-adhesive bond-line in mode ii for spruce wood glued by various adhesives. V: Wood technology & product design : proceedings. Skopje: Faculty of design and technologies of furniture and interior. 2019, str. 186-193.

25. PRISLAN, Rok. Uporaba Raspberry Pi za izdelavo Hi-Fi zvočniškega sistema. V: ŽEMVA, Andrej (ur.), TROST, Andrej (ur.). Zbornik osemindvajsete mednarodne Elektrotehniške in računalniške konference ERK 2019 = Proceedings of the Twenty-eighth International Electrotechnical and Computer Science Conference ERK 2019, ERK 2019, Portorož, Slovenija, 23.-24. september 2019, (Zbornik ... Elektrotehniške in računalniške konference (Online), ISSN 2591-0442, 28). Ljubljana: Društvo Slovenska sekcija IEEE. 2019, str. 198-201.

Published scientific conference contribution abstract
Objavljeni povzetek znanstvenega prispevka na konferenci

1. PODREKAR, Nastja, ŠARABON, Nejc. The effects of cycle and treadmill desks on sedentary workers. V: Abstract book : Annual Meeting of the International Society of Behavioral Nutrition and Physical Activity, 4-7 June , 2019, Prague Czech Republic. [S. l.]: International Society of Behavioral Nutrition and Physical Activity. 2019, str. 244.

2. KASTELIC, Kaja, ŠARABON, Nejc. The effect of work shift on daily activity behaviors and dietary pattern in crane operators. V: Abstract book : Annual Meeting of the International Society of Behavioral Nutrition and Physical Activity, 4-7 June , 2019, Prague Czech Republic. [S. l.]: International Society of Behavioral Nutrition and Physical Activity. 2019, str. 832.

3. HAJDU, László, DÁVID, Balázs, KRÉSZ, Miklós Ferenz. Traffic load simulation for different sensor placements. V: IVÁNYI, Peter (ur.). Abstract book for the 15th Miklós Iványi International PhD & DLA symposium, Pécs 28-29 October 2019 :architectural, engineering and information sciences, 15th Miklós Iványi International PhD & DLA symposium, Pécs 28-29 October 2019. Pécs: Pollack Press. cop. 2019, str. 142.

4. TÓTH, Attila, KRÉSZ, Miklós Ferenz. Lower bound definition for working time in crew scheduling problem. V: IVÁNYI, Peter (ur.). Abstract book for the 15th Miklós Iványi International PhD & DLA symposium, Pécs 28-29 October 2019 : architectural, engineering and information sciences, 15th Miklós Iványi International PhD & DLA symposium, Pécs 28-29 October 2019. Pécs: Pollack Press. cop. 2019, str. 167.

5. SCHAU, Erwin Andreas Meissner, PRELOVŠEK NIEMELÄ, Eva, NIEMELÄ, Aarne, ALENCAR GAVRIC, Tatiana Abaurre, ŠUŠTERŠIČ, Iztok. Life cycle assessment benchmark for wooden buildings in Europe. V: Abstract book, 9th international conference on Life cycle management, 1 - 4 September 2019 Poznan, Poland. [S. l.: s. n.]. 2019, str. 101.

6. SLAVEC, Ana, BURNARD, Michael David, ROVERE, Barbara. Methodological challenges of measuring innovation activities of micro companies. V: LUSA, Lara (ur.), KASTRIN, Andrej (ur.), BLEJEC, Andrej (ur.). Abstracts and program. Ljubljana: Statistical Society of Slovenia. 2019, str. 25.

7. KRÉSZ, Miklós Ferenz. Uniquely restricted (g,f) (g,f)-factors. V: CABELLO, Sergio (ur.), MOHAR, Bojan (ur.). Abstracts of the 9th Slovenian International Conference on Graph Theory, Bled, Slovenia, June 23-29, 2019. Ljubljana: Institute of Mathematics, Physics and Mechanics, IMFM. 2019, str. 149-150.

8. SANDAK, Anna Malgorzata, SANDAK, Jakub Michal. Fasády na báze prírodných materiálov - výzvy a perspektívy = Bio-based building envelops - challenges and perspectives. V: Abstraktový zborník z konferencie Zdravé domy - Interiér 2019 - Identita sk, Bratislava 27-28. september 2019 = Conference abstracts proceedings Healthy houses interior 2019 identity sk, Bratislava, September 27 - 28, 2019. Bratislava: Slovenská technická univerzita. 2019, str. 28-29.

9. PEČNIK, Jaka Gašper, SCHWARZKOPF, Matthew, BURNARD, Michael David, KUTNAR, Andreja. Dynamic mechanical analysis of wood-plastic composites with varying filler ratios and the effect of accelerated weathering. V: AERC 2019 : book of abstracts, 13th Annual European Rheology Conference, April 8-11, 2019, Portorož, Slovenia. [Ljubljana]: Slovenian Society for Experimental Mechanics: Slovenian Society of Rheology. 2019, str. 123-124.

10. MARROT, Laetitia Sarah Jennifer, FESTUS ALAO, Percy, KALLAKAS, Heikko, POLTIMÄE, Triinu, KERS, Jaan. Assessment of extended retted hemp fibres for composite reinforcement: fibre properties and adhesion with polyactide matrix. V: FANGUEIRO, Raul (ur.). Book of abstracts : ICNF 2019 : 4th International Conference on Natural Fibers, Smart Sustainable Solutions, 1. 2. 3. july 2019, Porto, Portugal, 4th International Conference on Natural Fibers, Smart Sustainable Solutions, 1. 2. 3. july 2019, Porto, Portugal. Porto:

Tecminho, Associação Universidade-Empresa Para o Desenvolvimento. 2019, str. 176-177.

11. SMAJLA, Darjan, GARCÍA RAMOS, Amador, TOMAŽIN, Katja, STROJNIK, Vojko. Acute effects of different exercise modalities on ankle force sense in young and old adults. V: BUNC, Václav (ur.), TSOLAKIDIS, E. (ur.). Book of abstracts, 24th Annual congress of the European college of sport science, 3 - 6 July 2019, Prague. Prague: European College of Sport Science. 2019, str. 246-247.

12. SEBERA, Václav, PEČNIK, Jaka Gašper, AZINOVIĆ, Boris, KRAMAR, Miha. Numerical modeling of wood-adhesive bond-line in mode ii for spruce wood glued by various adhesives. V: Book of abstracts, 4th International Scientific Conference Wood Technology & Product Design, 4th-7th September, 2019, Ohrid, North Macedonia. Skopje: Ss. Cyril and Methodius University. 2019, str. 52-53.

13. PEČNIK, Jaka Gašper, SEBERA, Václav, AZINOVIĆ, Boris, KRAMAR, Miha. Experimental evaluation of frac ture properties and cohesion law of wood-adhesive bond-line in mode II usin g end-notched flexure. V: Book of abstracts, International conference on Computational methods in wood mechanics - from material properties to timber structures, June 17-19, 2019, Växjö, Sweden. Växjö: Linnaeus University. 2019, str. 56.

14. SEBERA, Václav, PEČNIK, Jaka Gašper, AZINOVIĆ, Boris, KRAMAR, Miha. Numerical modeling of wood-adhesi ve bond-line in mode II for be ech wood glued by various adhesives. V: Book of abstracts, International conference on Computational methods in wood mechanics - from material properties to timber structures, June 17-19, 2019, Växjö, Sweden. Växjö: Linnaeus University. 2019, str. 57.

15. ŠARABON, Nejc. Physical conditioning interventions in older adults : literature review with the focus on training program description, study design and statistical analysis. European Journal of Translational Myology, ISSN 2037-7460, 2019, vol. 29, no. 1, str. 68.

16. HARANT, Monika, MILLARD, Matthew, ŠARABON, Nejc, MOMBAUR, Katja. Cost function evaluation for optimizing design and actuation of an active exoskeleton to ergonomically assist lifting motions. V: HUMANOIDS 2019 : 2019 IEEE-RAS 19th International Conference on Humanoid Robots, Toronto, Canada, October 15-17, 2019, IEEE-RAS 19th International Conference on Humanoid Robots, October 15-17, 2019, Toronto, Canada. Toronto: IEEE Robotics & Automation Society, 2019.

17. PODLOGAR, Tina, JURJEVČIČ TRŽAN, Maja, POŠTUVAN, Vita, DE LEO, Diego. Mental health literacy in adult population in Slovenia. V: IASP 2019 : breaking down walls & building bridges, 30th World Congress of the International Association for Suicide Prevention, Derry Londonderry, 17-21 September 2019. [S. l.: s. n.], 2019.

18. PODLOGAR, Tina, DE LEO, Diego, ŽVELC, Gregor. Therapists' experiences and views on working with suicidal clients : a qualitative study. V: IASP 2019 : breaking down walls & building bridges, 30th World Congress of the International Association for Suicide Prevention, Derry Londonderry, 17-21 September 2019. [S. l.: s. n.], 2019.

19. DE LEO, Diego. Loneliness and suicide. V: DE LEO, Diego (ur.), POŠTUVAN, Vita (ur.). Intuition, imagination and innovation in Suicidology Conference : 10th TRIPLE i, Piran, 27th - 28th May 2019 : programme and abstract book. Koper: Založba Univerze na Primorskem. 2019, str. 17.

20. PODLOGAR, Tina, ŽVELC, Gregor, DE LEO, Diego. Working with suicidal clients : a qualitative perspective on therapists' experiences and views. V: DE LEO, Diego (ur.), POŠTUVAN, Vita (ur.). Intuition, imagination and innovation in Suicidology Conference : 10th TRIPLE i, Piran, 27th - 28th May 2019 : programme and abstract book. Koper: Založba Univerze na Primorskem. 2019, str. 19.

21. PRISLAN, Rok, SVENŠEK, Daniel. The importance of periodic ray paths in geometrical acoustics - some practically relevant examples. V: ISRA 2019 - Amsterdam, International Symposium on Room Acoustics, Sept. 15-17, 2019. [S. l.: s. n.]. 2019.

22. MALI KOVAČIČ, Urška, PODLOGAR, Tina, DE LEO, Diego, POŠTUVAN, Vita. Mladinsko delo, krepitev duševnega zdravja in preprečevanje samomora. V: Povzetki s konference = Conference abstracts, 8. mednarodni kongres psihologov Slovenije, Zreče, 19.-21. 9. 2019, (Psihološka obzorja, ISSN 2350-5141, Letn. 28, 2019). [Ljubljana]: Društvo psihologov Slovenije. 2019, str. 72.

23. PODLOGAR, Tina, ŽVELC, Gregor, POŠTUVAN, Vita, DE LEO, Diego. Težave, ki jih doživljajo strokovnjaki za duševno zdravje pri delu s samomorilno ogroženimi posamezniki. V: Povzetki s konference = Conference abstracts, 8. mednarodni kongres psihologov Slovenije, Zreče, 19.-21. 9. 2019, (Psihološka obzorja, ISSN 2350-5141, Letn. 28, 2019). [Ljubljana]: Društvo psihologov Slovenije. 2019, str. 93.

24. BURNARD, Michael David. Evaluating the role of Europe's wood value chain in the circular bio-economy : the WoodCircus project. V: LEVAN-GREEN, Susan L. (ur.). Proceedings of the 62nd International Convention of Society of Wood Science and Technology, October 20-25, 2019, Yosemite, California USA, 62nd International Convention of Society of Wood Science and Technology October 20-25, 2019, Yosemite, California USA. Yosemite: [s. n.]. 2019, str. 75.

25. DEVALLANCE, David Brian. Development of nano-cellulose based thermal insulating and encapsulated phase change materials for energy efficient buildings. V: LEVAN-GREEN, Susan L. (ur.). Proceedings of the 62nd International Convention of Society of Wood Science and Technology, October 20-25, 2019, Yosemite, California USA, 62nd International Convention of Society of Wood Science and Technology October 20-25, 2019, Yosemite, California USA. Yosemite: [s. n.]. 2019, str. 94.

26. SIMMONS, Amy Noel. The forest for the trees :understanding the experiences of female PhDs in forestry-related academia. V: LEVAN-GREEN, Susan L. (ur.). Proceedings of the 62nd International Convention of Society of Wood Science and Technology, October 20-25, 2019, Yosemite, California USA, 62nd International Convention of Society of Wood Science and Technology October 20-25, 2019, Yosemite, California USA. Yosemite: [s. n.]. 2019, str. 108.

27. SCHWARZKOPF, Matthew. Synchrotron-based analysis of densified wood impregnated with curing resin. V: LEVAN-GREEN, Susan L. (ur.). Proceedings of the 62nd International Convention of Society of Wood Science and Technology, October 20-25, 2019, Yosemite, California USA, 62nd International Convention of Society of Wood Science and Technology October 20-25, 2019, Yosemite, California USA. Yosemite: [s. n.]. 2019, str. 154.

28. NEYSES, Benedikt, PEETERS, Kelly, RAUTKARI, Lauri, ALTGEN, Michael. In-situ penetration of ionic liquids into surface-densified Scots pine. V: LEVAN-GREEN, Susan L. (ur.). Proceedings of the 62nd International Convention of Society of Wood Science and Technology, October 20-25, 2019, Yosemite, California USA, 62nd International Convention of Society of Wood Science and Technology October 20-25, 2019, Yosemite, California USA. Yosemite: [s. n.]. 2019, str. 165-166.

29. BURNARD, Michael David, KUTNAR, Klavdija. Data science at the University of Primorska : combining fundamentals with data and challenges from buildings, wood and processing science. V: LEVAN-GREEN, Susan L. (ur.). Proceedings of the 62nd International Convention of Society of Wood Science and Technology, October 20-25, 2019, Yosemite, California USA, 62nd International Convention of Society of Wood Science and Technology October 20-25, 2019, Yosemite, California USA. Yosemite: [s. n.]. 2019, str. 278.

30. AZAMBUJA, Rafael, DEVALLANCE, David Brian, MCNEEL, Joseph, HASSLER, Curt. Evaluation of NHLA graded yellow-poplar lumber regraded for structural use in CLT panel production. V: LEVAN-GREEN, Susan L. (ur.). Proceedings of the 62nd International Convention of Society of Wood Science and Technology, October 20-25, 2019, Yosemite, California USA, 62nd International Convention of Society of Wood Science and Technology October 20-25, 2019, Yosemite, California USA. Yosemite: [s. n.]. 2019, str. 429-430.

31. PRISLAN, Rok, SVENŠEK, Daniel. Validation of ray-tracing semiclassical (RTS) low frequency acoustic modelling for rooms with curved boundaries. V: OCHMANN, Martin (ur.). Proceedings of the ICA 2019 and EAA Euroregio, 23rd International Congress on Acoustics, integrating 4th EAA Euroregio 2019, 9 - 13 September 2019, Aachen, Germany, (International Congress on Acoustics, ISSN 2226-7808), (Proceedings of the ICA congress (Online), ISSN 2415-1599). Berlin: Deutsche Gesellschaft für Akustik. cop. 2019.

32. MILAČIČ, Radmila, ZULIANI, Tea, PEETERS, Kelly, NOVOTNIK, Breda, ŽIGON, Dušan, ŠČANČAR, Janez. Analytical procedures for speciation of zinc, nickel and chromium in food samples page. V: HEATH, David John (ur.), HORVAT, Milena (ur.), OGRINC, Nives (ur.). Programme and book of abstracts, 1st ISO-FOOD International Symposium on Isotopic and Other Techniques in Food Safety and Quality, Portorož, Slovenia, April 1-3, 2019, (ISOFd Food, Safety quality traceability). Ljubljana: Jožef Stefan Institute. 2019, str. 43.

33. ŠARABON, Nejc, MARUŠIČ, Jan. Characteristics of eccentric exercise for the hamstrings and their potential for injury prevention. V: KACIN, Alan (ur.), PIRKMAJER, Sergej (ur.), PODBREGAR, Matej (ur.). Skeletal muscle research - from cell to human 2019 : book of abstracts : symposium and workshop, University of Ljubljana, Faculty of Medicine, Slovenia 26th - 28th May 2019. Ljubljana: Faculty of Medicine: Faculty of Health Sciences. 2019, str. 48-49.

34. RETKO, Klara, KAVČIČ, Maša, LEGAN, Lea, PENKO, Ana, TAVZES, Črtomir, ROPRET, Polonca. Beehive panel paintings : material characterisation. V: Technart 2019, International Conference on Use of Analytical Techniques for Characterization of Artworks, 7 May - 10 May 2019, Brugge, Belgium :conference program. Antwerp: University of

Antwerp, Flemish Research Centre for the Arts. 2019, str. 447.

35. DÁVID, Balázs. Heurisztikus módszer moduláris elemekből álló heterogén szerkezetek kialakítására. V: XXXIII. Magyar operációkutatási konferencia : program és előadáskivonatok. Szeged: [s. n.]. 2019, str. 49.

36. KRÉSZ, Miklós Ferenz. Egyedi mintázatú (g,f) (g,f)-faktorok. V: XXXIII. Magyar operációkutatási konferencia : program és előadáskivonatok. Szeged: [s. n.]. 2019, str. 79.

37. PODREKAR, Nastja, KASTELIC, Kaja, ŠARABON, Nejc. Ustreznost šolskega pohištva = Suitability of clasroom furniture. V: PETELIN, Ana (ur.), et al. Zdravje otrok in mladostnikov : zbornik povzetkov z recenzijo : 3. znanstvena in strokovna konferenca z mednarodno udeležbo = Health of children and adolescents : book of abstracts : 3rd scientific and professional international conference. Koper: Založba Univerze na Primorskem: = University of Primorska Press. 2019, str. 166-167.

38. KASTELIC, Kaja, PODREKAR, Nastja, ŠARABON, Nejc. Povezanost sedentarnosti in bolečine v spodnjem delu hrbta med otroci in mladostniki = Association of sedentary time and low back pain in children and adolescents. V: PETELIN, Ana (ur.), et al. Zdravje otrok in mladostnikov : zbornik povzetkov z recenzijo : 3. znanstvena in strokovna konferenca z mednarodno udeležbo = Health of children and adolescents : book of abstracts : 3rd scientific and professional international conference. Koper: Založba Univerze na Primorskem: = University of Primorska Press. 2019, str. 190-191.

39. DÁVID, Balázs, DEVALLANCE, David Brian, KRÉSZ, Miklós Ferenz, MARROT, Laetitia Sarah Jennifer, SANDAK, Anna Malgorzata, SANDAK, Jakub Michal, BORIN, Bojan, FABJAN, Ema, ZULE, Janja. Ekspertni sistemski pristop k optimizaciji procesov za proizvodnjo vlaknin = Expert systrem pristop k optimizaciji procesov za proizvodnjo vlaknin. V: PREBIL BAŠIN, Petra (ur.), JAMNIK, Teja (ur.), KLIČIĆ, Sabina (ur.). Med krožnim, bio in digitalnim : zbornik povzetkov = Between circular, bio and digital : book of abstracts, 23. dan slovenskega papirništva in 46. mednarodni letni simpozij Društva inženirjev in tehnikov papirništva Slovenije (DITP), 20. - 21. november 2019, Postojna, Slovenija. Ljubljana: GZS ZPPPI: DITP. 2019, str. 44-45.

Conference contribution without publication
Prispevek na konferenci brez natisa

1. SANDAK, Jakub Michal. Click Design - delivering fingertip knowledge to enable service life performance specification of wood, 11. tradicionalna razstava in prireditev Čar lesa, Ljubljana, 13. maj 2019.

2. KUTNAR, Andreja. Concrete jungle or forest city, FTPc2019, The Marcus Wallenberg Foundation event, Helsinki, 27 November 2019.

3. KUTNAR, Andreja. COST actions, Communicating in science: Scientific Conference for Young Researchers, 17. 9. 2019.

4. ŠUŠTERŠIČ, Iztok. Energetska in statična sanacija stavb v KLP, 11. tradicionalna razstava in prireditev Čar lesa, Ljubljana, 13. maj 2019.

5. PODREKAR, Nastja. Ergonomic design of furniture, 1st International conference: Timber - a healthy future for sustainable buildings, 7th March 2019, Koper.

6. TAVZES, Črtomir. European technological platform Vision 2040 for the forest based sector, Adriatic Wood Days 2019, Dubrovnik, 2.-3. 12. 2019.

7. ŠARABON, Nejc. Faculty of health sciences, University of Primorska, projects, possibilities of cooperation and exchange : presentation of participating institution at the First belt and road physical education forum, Zagreb, April 16-19, 2019.

8. TAVZES, Črtomir. Gozdno-lesna tehnološka platforma, 11. tradicionalna razstava in prireditev Čar lesa, Ljubljana, 13. maj 2019.

9. DEVALLANCE, David Brian. Hardwoods for CLTs: opportunities, issues, and barriers : 62nd International Convention of Society of Wood Science and Technology, Yosemite, California USA, October 20-25, 2019.

10. ŠUŠTERŠIČ, Iztok. HCLTP - hybrid cross laminated timber plates, 11. tradicionalna razstava in prireditev Čar lesa, Ljubljana, 13. maj 2019.

11. PEETERS, Kelly. Improvement of dimensional stability and fungal properties of wood modified by the Maillard reaction, The Marcus Wallenberg Foundation event, Falun, 6-9 October 2019.

12. SANDAK, Anna Malgorzata. InnoRenew CoE's activities in the field of wood modification, COST FP1407 WG4 Workshop, February 4, 2019, Koper, Slovenia.

13. BURNARD, Michael David. Innovation and research management in wood modification companies - survey results, COST FP1407 WG4 Workshop, February 4, 2019, Koper, Slovenia.

14. SANDAK, Jakub Michal. Izzivi za uporabo lesa v 21. stoletju, 25. slovenski festival znanosti z mednarodno udeležbo Ko kakovost postane moja strast, Ljubljana, 26. september 2019.

15. SLAVEC, Ana. Načrti za podatke o obnovljivih materialih in produktih, konferenca "Odprti raziskovalni podatki" v Sloveniji, Maribor, 14. november 2019.

16. ŠARABON, Nejc. Novel approaches to active and healthy ageing in outdoor environments, 1st International conference: Timber - a healthy future for sustainable buildings, 7th March 2019, Koper.

17. SANDAK, Anna Malgorzata. Perceptions of material and occupant satisfaction, 1st International conference: Timber - a healthy future for sustainable buildings, 7th March 2019, Koper.

18. ŠUŠTERŠIČ, Iztok. Prednosti uporabe lesa v stavbah, TRIPLE WOOD Seminar za arhitekte in projektante, Maribor, 26. 11. 2019.

19. BURNARD, Michael David. Predstavitev raziskovalnega inštituta InnoRenew CoE v luči njegove mednarodne dejavnosti, 11. tradicionalna razstava in prireditev Čar lesa, Ljubljana, 13. maj 2019.

20. PODREKAR, Nastja. Preverbe (ne)skladnosti mer šolskega pohištva in iskanje možnosti izboljšav :prispevek na "Raziskovalnem dnevu UP FVZ" v Novi Gorici, 13. 6. 2019 in v Izoli, 14. 6. 2019.

21. LIPOVAC, Dean. Psychological assessment of well-being in buildings, 1st International conference: Timber - a healthy future for sustainable buildings, 7th March 2019, Koper.

22. ŠARABON, Nejc. Raziskave in razvoj na področju aktivnega staranja : izkušnje iz bilateralnih projektov Avstrija-Slovaška : prispevek na "Raziskovalnem dnevu UP FVZ" v Novi Gorici, 13. 6. 2019.

23. KUTNAR, Andreja. Selective extraction of high-value molecules from forest products processing residues in the speciality chemicals sector : 62nd International Convention of Society of Wood Science and Technology, Yosemite, California USA, October 20-25, 2019.

24. KUTNAR, Andreja. Setting the scene, COST Academy - Sustainability of COST Actions networking event, Brussels, 4 December 2019.

25. ŠUŠTERŠIČ, Iztok. Trends and considerations in CLT construction, 1st International conference: Timber - a healthy future for sustainable buildings, 7th March 2019, Koper.

26. ŠUŠTERŠIČ, Iztok. Uporaba postopkov zagotavljanja kakovosti v fazi načrtovanja in na kraju samem, TRIPLE WOOD Seminar za arhitekte in projektante, Maribor, 26. 11. 2019.

27. ŠARABON, Nejc. V iskanju večje uporabnosti temeljnega odnosa : sila, hitrost, moč : prispevek na "Raziskovalnem dnevu UP FVZ" v Izoli, 14. 6. 2019.

28. SLAVEC, Ana. Vključevanje družboslovnih raziskav v dediščinsko znanost, informativni dogodek Evropska raziskovalna infrastruktura za dediščinsko znanost - Slovenija, Ljubljana, 9. 12. 2019.

Professional journal article
Strokovni članek

1. ŠUMIGA, Barbara, KUTNAR, Andreja. Inovativni dve leti delovanja InnoRenew CoE = Two innovative years of the operation of InnoRenew CoE. Papir : revija Društva inženirjev in tehnikov papirništva, ISSN 0350-6614. [Tiskana izd.], nov. 2019, letn. 47, št. 22, str. 32.

2. ŠPENKO, Matic, VATOVEC, Rok, KOZINC, Žiga, ŠARABON, Nejc. Video-analiza za vrednotenje in popravljanje tehnike teka : ponovljivost, veljavnost in uporabnost. Šport : revija za teoretična in praktična vprašanja športa, ISSN 0353-7455, 2019, letn. 67, št. 1/2, str. 34-38.

3. PRELOVŠEK NIEMELÄ, Eva. Potrebujemo veliko sliko. Varčna hiša : lesena & montažna & eko, ISSN 2232-4763, 2019, št. 14, str. 20-21.

4. ŠUŠTERŠIČ, Iztok. Projektiranje višjih lesenih stavb. Varčna hiša : lesena & montažna & eko, ISSN 2232-4763, 2019, št. 14, str. 26-27.

5. PRELOVŠEK NIEMELÄ, Eva, NIEMELÄ, Aarne. Arhitektura kot raziskovalni projekt. Varčna hiša : lesena & montažna & eko, ISSN 2232-4763, 2019, št. 14, str. 85-86.

6. NIEMELÄ, Aarne. Finske lesene hiše in zakonodajna podpora v primerjavi s slovensko. Varčna hiša : lesena & montažna & eko, ISSN 2232-4763, 2019, št. 14, str. 85-86.
7. ŠUŠTERŠIČ, Iztok. Dinamični odziv visokih lesenih zgradb pri uporabni obratovalni obtežbi. Varčna hiša : lesena & montažna & eko, ISSN 2232-4763, 2019, št. 14, str. 90.
8. BURNARD, Michael David. Podpora ključni vlogi gozdarskega sektorja v krožnem bio-gospodarstvu - WoodCircus. Varčna hiša : lesena & montažna & eko, ISSN 2232-4763, 2019, št. 14, str. 92.
9. SANDAK, Jakub Michal, SANDAK, Anna Malgorzata. Načrtovanje življenjske dobe lesa s projektom CLICKdesign. Varčna hiša : lesena & montažna & eko, ISSN 2232-4763, 2019, št. 14, str. 94.

Patent application
Patentna prijava

1. KANTNER, Wolfgang, ZICH, Thomas, SCHWARZKOPF, Matthew, BURNARD, Michael David, MIKULJAN, Marica, KUTNAR, Andreja. Method for preparation of densified wood article : EP19204677.9. München: European Patent Office, 2019. 1 zv. (loč. pag.).
2. MARKOVIĆ, Goran, ŠARABON, Nejc. Apparatus for the analysis and measurement of maximum and expolsive strength of lower extremity muscles : 19020097.2-1115. Munich: European Patent Office, 2019. 16 str.

Radio or television event
Radijska ali televizijska oddaja

1. KUTNAR, Andreja, SCHWARZKOPF, Matthew, MARROT, Laetitia Sarah Jennifer, ŠUŠTERŠIČ, Iztok, PRELOVŠEK NIEMELÄ, Eva, BURNARD, Michael David. How technology influencing the future of food and housing - whilst respecting the environment : prispevek v oddaji Euronews, 7. okt. 2019.
2. TOMAŽIN, Andrej (intervjuvanec), MALI, Franc (intervjuvanec), KORDEŠ, Urban (intervjuvanec), BURNARD, Michael David (intervjuvanec), GABER, Slavko (intervjuvanec), BERGANT, Mojca (intervjuvanec). Inovativnost : oddaja Na kratko, TV SLO 1, 8. 10. 2019.
3. KUTNAR, Andreja. Les prihaja nazaj, v naš vsakdan : oddaja Radijski utrip, Radio Ognjišče, 17. jul. 2019.
4. ŠUŠTERŠIČ, Iztok. Trajnostna gradnja z uporabo obnovljivih materialov, predvsem lesa (1. del) : oddaja Hevreka, Rai, 14. okt. 2019.
5. ŠUŠTERŠIČ, Iztok. Trajnostna gradnja z uporabo obnovljivih materialov, predvsem lesa (2. del) : oddaja Hevreka, Rai, 21. okt. 2019.

Invited lectures at conferences without publication
Vabljeno predavanje na konferenci brez natisa

1. ŠARABON, Nejc. Complex nature of functional body asymmetries : context of testing and injury prevention : vabljeno predavanje na 11th EFSMA congress of sports medicine, Portorož, October 3 - 5, 2019.
2. BURNARD, Michael David. Well-being effects of wood in indoor applications : Drivers for Wood Construction, Joensuu, 24th September 2019.

Invited lectures at foreign universities
Vabljeno predavanje na tuji univerzi

1. SANDAK, Jakub Michal. Characterization of wood surface, Mendel University, Brno, 2.-5. 6. 2019.
2. KRÉSZ, Miklós Ferenz. Community detection in networks and its practical applications, University of Turku, Faculty of Science and Engineering, Turku, 16th October 2019.
3. SCHWARZKOPF, Matthew. From forest to frame, Milwaukee School of Engineering, Milwaukee, November 1, 2019.
4. BURNARD, Michael David. Human health in the built environment: nature, restoration, and buildings', Aalto University, Espoo, Finland, 28th August 2019.

5. TAVZES, Črtomir, TURK DERMASTIA, Kim. InnoRenew CoE renewable materials and healthy environments research and innovation centre of excellence, and its living laboratory, University of Banja Luka, Faculty of Architecture, Civil Engineering and Geodesy, December 12th, 2018.

6. SCHWARZKOPF, Matthew. InnoRenew CoE: from fundamentals to application, USDA Forest Service, Forest Products Laboratory, Madison, October 28th 2019.

7. SCHWARZKOPF, Matthew. InnoRenew CoE: fundamentals to applications, Mendel University, Brno, May 7th, 2019.

8. HANSEN, Eric, ROVERE, Barbara. Innovation systems of circular bioeconomy, University of Helsinki, Finland, August 19-23rd, 2019.

9. SLAVEC, Ana. Metodološki izzivi merjenja inovacijskih aktivnosti mikro podjetij, Univerza v Ljubljani, Medicinska fakulteta, 29. oktober 2019.

10. SCHWARZKOPF, Matthew. Olives and wood science, USDA Forest Service, Forest Products Laboratory, Madison, October 28th 2019.

11. SCHWARZKOPF, Matthew. Olives and wood: local solutions using biomass residue, University of Zagreb, zagreb, September 4th 2019.

12. SCHWARZKOPF, Matthew. Olives InnoRenew CoE: from fundamentals to application, University of Zagreb, zagreb, September 4th 2019.

13. STARMAN, Vesna, PODREKAR, Nastja. REED-inspired co-creation of a school playground - example of a InnoRenew living lab activity, University of Belgrade, Faculty of Forestry, Belgrade, 17th December 2019.

14. SLAVEC, Ana. Research data managemen for data on renewable materials and products, School of Chemical Engineering, Aalto University, Espoo, October 22, 2019.

15. SLAVEC, Ana. Research data management for data on renewable materials and products, Mendel University, Faculty of foresst and wood technology, Brno, 4th November 2019.

Editor – InnoRenew CoE employees
Urednik – zaposleni v InnoRenew CoE

1. Crisis. DE LEO, Diego (glavni urednik 2008-). Toronto: C. J. Hogrefe, 1980-. ISSN 0227-5910.

2. Drvna industrija: Znanstveno stručni časopis za pitanja drvne tehnologije. SANDAK, Jakub Michal (član uredniškega odbora 2017-). Zagreb: Šumarski fakultet Sveučilišta u Zagrebu: Hrvatsko šumarsko društvo: Croatiadrvo, d. d.: Exportdrvo, p. o., 1950-. ISSN 0012-6772.

3. European journal of wood and wood products. KUTNAR, Andreja (član uredniškega odbora 2017-), SANDAK, Jakub Michal (član uredniškega odbora 2018-). [Print ed.]. Berlin: Springer-Verlag, 1937-. ISSN 0018-3768.

4. Frontiers in human neuroscience. ŠARABON, Nejc (član uredniškega odbora 2017-). Lausanne: Frontiers Research Foundation, 2008-. ISSN 1662-5161.

5. Homo sporticus : naučno-stručni časopis iz oblasti sporta i tjelesnog odgoja. ŠARABON, Nejc (član uredniškega odbora 2009-). Sarajevo: Fakultet sporta i tjelesnog odgoja, 1998-. ISSN 1512-8822.

6. Journal of sports science. ŠARABON, Nejc (član uredniškega odbora 2013-). El Monte, CA: David Publishing Company, 2013-. ISSN 2332-7839.

7. Montenegrin journal of sports science and medicine. ŠARABON, Nejc (član uredniškega odbora 2012-). Podgorica: Crnogorska sportska akademija. ISSN 1800-8763.

8. Wood and fiber science. KUTNAR, Andreja (član uredniškega odbora 2016-). Lawrence, Kan.: The Society. ISSN 0735-6161.

9. Wood Material Science & Engineering. KUTNAR, Andreja (glavni urednik 2017-). Abingdon: Taylor & Francis. ISSN 1748-0272.

10. Wood Material Science & Engineering. SANDAK, Anna Malgorzata (član uredniškega odbora 2017-). Abingdon: Taylor & Francis. ISSN 1748-0272.

11. DE LEO, Diego (urednik), POŠTUVAN, Vita (urednik). Intuition, imagination and innovation in Suicidology Conference : 10th TRIPLE i, Piran, 27th - 28th May 2019 : programme and abstract book. Koper: Založba Univerze na Primorskem, 2019. 25 str., ilustr., graf. prikazi. ISBN 978-961-7055-68-9.

12. MAESTRE, Rafael (urednik), BURNARD, Michael David (urednik). Proceedings of the second

COST Action CA16226 conference meeting, Ohrid, North Macedonia, 17th October 2019. [S. l.: s. n.], 2019.

13. KANER, Jake (urednik), MAESTRE, Rafael (urednik), LAMESKI, Petre (urednik), ISAACSON, Michal (urednik), TAVETER, Kuldar (urednik), TOMSONE, Signe (urednik), MARESOVA, Petra (urednik), BURNARD, Michael David (urednik), MELERO, Francisco Javier (urednik). State of the art report for smart habitat for older persons. [S. l.: s. n.], 2019. Ilustr. ISBN 978-84-09-12460-2.

14. ELVNERT, Johan (urednik), GALEMBERT, Bernard de (urednik), JERNSTRÖM, Eeva (urednik), MAUSER, Harald (urednik), TAVZES, Črtomir (urednik), WILHELMSSON, Lars (urednik). Strategic research and innovation agenda 2030 of the European forest-based sector. Brussels: The European Forestry House, 2019.

Co-advisor of PhD dissertation
Somentor pri doktorskih disertacijah

1. VIMPOLŠEK, Boštjan. Logistika v krožnem gospodarstvu : model za ravnanje z odsluženim lesom : doktorska disertacija. Celje: [B. Vimpolšek], 2019. XIII, 213 str., 91 str. (Andreja KUTNAR co-advisor).

Co-mentor in diploma thesis (Bologna 1st cycle study)
Somentor pri diplomskih delih (bolonjski študij 1. stopnje)

1. SCHWARZMANN, Jon. Prikolica za transport motornega kolesa : diplomsko delo. Ljubljana: [J. Schwarzmann], 2019. 43 str. (Marica MIKULJAN co-advisor).

2. ŠKERJANC, Nina. Produkt na osnovi tehnologije materiala iz micelija : diplomsko delo. Ljubljana: [N. Škerjanc], 2019. 52 str. (Marica MIKULJAN co-advisor).

Accepted scientific article
Odobreni znanstveni članek

1. Petr Klímek, Václav SEBERA, Darius Tytko, Martin Brabec. Micromechanical properties of beech cell wall measured by micropillar compression test and nanoindentation mapping. Holzforschung.

2. Nastja PODREKAR, Žiga Kozinc, Nejc ŠARABON. The effects of using treadmills and cycle desks on work performance and cognitive functions in sedentary workers: a meta-analysis. Submitted to: Work A Journal of Prevention, Assessment & Rehabilitation.

Accepted scientific conference contribution abstracts
Odobreni povzetek znanstvenega prispevka na konferenci

1. PODREKAR, Nastja; LIPOVAC, Dean; BURNARD, Michael; ŠARABON Nejc. Suitability and Thermal Comfort of Different Desktop Materials. 30th International Conference on Wood Science and Technology – ICWST 2019, 12-13.12.2019, Zagreb.

Accepted scientific conference contribution – full paper
Odobreni znanstveni prispevek na konferenci – celotni članek

1. Aleksandar TOŠIĆ, Jernej Vičič and Michael MRISSA. A Blockchain-based Decentralized Self-balancing Architecture for the Web of Things. Submitted to: Modern Approaches in Data Engineering and Information System Design (MADEISD) – in the frame of ADBIS 2019, September 8-11.2019, Bled, Slovenia.

2. KRÉSZ, Miklós and CYMER, Radoslaw. On the complexity of a filtering problem for constraint programming: Decomposition by the structure of perfect matchings. The 15th International Symposium on Operations Research in Slovenia.

3. SAJINČIČ, Nežka, SANDAK, Anna, ISTENIČ STARČIČ, Andreja. Gamification in Education and Learning. International Conference EDUvision 2019, 28 November – 30 November 2019, Ljubljana, Slovenia.

4. Jakub SANDAK, Kazimierz A. Orlowski, Anna SANDAK, Daniel Chuchala, Piotr Taube (2019) In-line measurement of wood surface roughness. 30th International Conference on Wood Science and Technology - ICWST 2019, 12-13 December 2019, Zagreb, Croatia.

5. Igor GAVRIC, Mislav Stepinac, Iztok SUSTERSIC: Connection ductility demand for different ductility levels in capacity design of multi-storey CLT buildings (abstract accepted for WCEE 2020 conference, Sendai, Japan); Paper to be submitted in January 2020.

6. Igor GAVRIC, Iztok SUSTERSIC: The effect of perpendicular walls on seismic behaviour of cross-laminated timber (CLT) buildings (submitted for WCTE 2020 conference, Santiago, Chile); Paper to be submitted in May 2020.

7. Iztok SUSTERSIC, Igor GAVRIC: Influence of secondary elements on a multi storey CLT building's horizontal stiffness – in-situ measurements in different construction stages (submitted for WCTE 2020 conference, Santiago, Chile); Paper to be submitted in May 2020.

8. Iztok SUSTERSIC, Olivier Flamand, Aleksandar Pavic, Anders Rønnquist, Marie Johansson, Andreas Linderholt, Bostjan Brank, Haris Stamatopoulos, Igor GAVRIC, Julie Lewis-Thompson, Pierre Landel, Kjell Malo, Fernando Perez, Rune Abrahamsen, Magne A Bjertnæs, Stephane Hameury, Manuel Manthey, Ludwig Hahusseau, Blaz Kurent, Saule Tulebekova, Wai Kei Ao, Lionel Cabaton, Olivier Germain, Petter Nåvik: Dynamic response of tall timber buildings under serviceability load – the DynaTTB research program and case study of a 7-storey CLT structure (submitted for WCTE 2020 conference, Santiago, Chile).

9. Olivier Flamand, Aleksandar Pavic, Anders Rønnquist, Marie Johansson, Andreas Linderholt, Bostjan Brank, Haris Stamatopoulos, Igor GAVRIC, Iztok SUSTERSIC, Julie Lewis-Thompson, Pierre Landel, Kjell Malo, Fernando Perez, Rune Abrahamsen, Magne A Bjertnæs, Stephane Hameury, Manuel Manthey, Ludwig Hahusseau, Blaz Kurent, Saule Tulebekova, Wai Kei Ao, Lionel Cabaton, Olivier Germain, Petter Nåvik: Dynamic response of tall timber buildings under service load – the DynaTTB research program (submitted for Eurodyn 2020 conference, Athens, Greece); Paper to be submitted in February 2020.

Revenue in 2019

Prihodki v letu 2019

In 2019, InnoRenew CoE revenues totalled €2,900,000. Of this, 70.11 percent was from the EU's Horizon2020 Framework Programme (H2020 Widespread-2-Teaming: #739574), 14.81 percent was from the Republic of Slovenia (investment funding of the Republic of Slovenia and the EU's European Regional Development Fund), 4.42 percent was from EU projects, 1.72 percent was from other international projects, 2.43 percent was earned from market services, 0.86 percent was from international traveling grants (COST Actions), 1.88 percent was from national projects and 3.78 percent was funded by the Slovenian Research Agency (ARRS).

Equipment purchases were €1,524,068.

V letu 2019 je imel InnoRenewCoE 2.900.000 evrov prihodkov. Od tega je 70,11 % sredstev pridobil iz okvirnega programa Evropske Unije Obzorje 2020 (H2020WIDESPREAD-2-Teaming; #739574), 14,81 % od Republike Slovenije (Financiranjenaložb Republike Slovenije in Evropske unije v okviru Evropskega sklada zaregionalni razvoj), 4,42 % iz evropskih projektov, 1,72 % iz drugih mednarodnihprojektov, 2,43%z izvajanji storitev na trgu, 0,86 % iz akcij COST, 1,88% iznacionalnih projektov ter 3,78 % iz projektov ARRS.

Za nabavo opreme je InnoRenew CoE leta 2019 namenil 1.524.068 evrov.

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Osnovni podatki

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Bank / Poslovna banka:	*NLB d.d.*
ARRS number / Številka raziskovalne organizacije v ARRS:	*3770*
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