

ESTONIAN ACADEMY OF SCIENCES
Science-for-policy and society activities with focus on climate change
Report for EASAC Council meeting 2-3 December 2021

Content:

- International events
- Events in Academy and in Academy-related organisation
- Articles and interviews in local press
- Conference presentations and scientific publications

Part 1 International events

- 14 April - The Changing Arctics, webinar in cooperation with Academia Europaea Bergen Knowledge Hub and Norwegian Embassy.
<https://www.akadeemia.ee/en/events/webinar-the-changing-arctic/>
- 28 June - Scientific Seminar on Energetics, in cooperation with Academies in Baltic States and in Hamburg. The 17th Conference on Baltic Intellectual Cooperation.
<https://www.akadeemia.ee/en/events/the-17th-baltic-conference-on-intellectual-co-operation-mathematics-for-society/>
- 29 – 30 November - The Gulf of Finland Science Days “New start for the Gulf of Finland co-operation “. Scientific conference in cooperation with the Finnish Environment Institute. <https://www.akadeemia.ee/en/the-gulf-of-finland-science-days-in-the-estonian-academy-of-sciences/>

Part 2 Events in Academy and in Academy related organisations

9 February - President Tarmo Soomere participated as invited expert at SAM scoping Workshop “Crisis resilience, preparedness and response“ with representatives of the Group of Chief Science Advisors, GCSA, European Group on Ethics in Science and Technologies, EGE, Joint Research Centre, JRC) and Science Advisory Mechanism, SAM set up by European Commission.

- 3 September - Estonian Academy of Sciences Standing Committee on Energy met with representatives of Industry (Viru Keemia Grupp, VKG). At the meeting contribution to the reduction of CO₂ was discussed.
- 13 September - President and representatives of the EAS met with the Estonian Association of Architects. Topics discussed: climate change and architecture, strengthening the process of knowledge-based decision-making in city planning.
- 18 November - Green turn of European industry: from critical raw materials to green technologies. Science afternoon (XIX) at the Estonian Academy of Sciences

<https://www.akadeemia.ee/sundmused/teadusparastlouna-xix-euroopa-toostuse-rohepoore-kriitilistest-maavaradest-rohetehnoloogiateni/>

- 19 November - Human being at border. Conference in cooperation with NGO *Eesti Kultuuri Koda*. 19 November. Among other topics the climate crisis was discussed from interdisciplinary viewpoints.

<https://arvamus.postimees.ee/7378085/eesti-kultuuri-koja-aastakonverents-inimene-piiril-eri-teadusvaldkondade-vaates>

Standing Committees of the Estonian Academy of Sciences

- Standing Committee on Energy is regularly advising the policy makers on climate crisis. 21 October - Chairman of the Committee Professor Arvi Hamburg participated at the webinar “Energy turn with a focus on Fit 55 in Estonia: can it be effective, profitable, and painless at the same time? Webinar, organized by the Foresight Centre of the Parliament of Estonia was targeted to local stakeholders, held in the Estonian language. <https://arenguseire.ee/videod/veebiseminar-kuidas-saaks-energiapoore-eestis-olla-uhtaegu-tohus-tulus-ja-valutu/>

Standing Committee on Nature Conservation

- 27 October - presentation about connections between diversity and climate change at the Conference on Environmental Education in Viljandi. Chairman of the committee Dr Urmas Tartes https://keskkonnaharidus.ee/sites/default/files/inline-files/Urmas_Tartes_Maap%C3%B5u_meie_all_ja_meie_%C3%BCmber_Keskkonnahariduse_konverents_2021.pdf
- a training in cooperation with the Environmental Board of Estonia in December 2021

Learned societies of the Estonian Academy of Sciences

- Estonian Naturalists` Society (founded in 1853) advising the public and spreading the messages of the COP 26 conference in Glasgow as widely as possible. A presentation on health impacts of climate crisis followed by panel discussion with two participants of the conference in Glasgow at the general meeting of the Estonian Naturalists` Society on 25 November.

Part 3 Articles and interviews in local media

20 January – Kalle Kirsimäe, “Phosphorite and rare earth elements – should Estonia plan mining?” Interview. Estonian Public Broadcasting (ERR) Novaator

<https://novaator.err.ee/1608079411/fosforiit-ja-haruldased-muldm metallid-kas-eesti-peaks-kaevandama>

22 January – Ülo Niinemets, “Is cleaner also cooler?”, article in local newspaper "Postimees"

<https://teejuhid.postimees.ee/7160717/ulo-niinemets-kas-puhtam-on-ka-jahedam>

2 February – Kalle Kirsimäe, “Phosphorite and rare earth elements - alternative to oil shale industry?” interview published in North-Eastern newspaper “Põhjarannik”.

<https://pohjarannik.postimees.ee/7169647/fosforiit-ja-haruldased-muldmetailid-kas-alternatiiv-polevkivitoostusele>

10 February – Kalle Kirsimäe, Interview in regional newspaper "Virumaa teataja".

<https://dea.digar.ee/cgi-bin/dea?a=d&d=virumaateataja20210210.2.6.1&e=-----et-25--1--txt-txIN%7ctxTI%7ctxAU%7ctxTA----->

9 March – Ülo Niinemets, “Wood burning has an impact on human health”, article in daily newspaper “Postimees”.

https://leht.postimees.ee/7196554/ulo-niinemets-puidupoletamine-pole-rohepoore?fbclid=IwAR2pdKmlHiznE0zOtKS5XCR4fjbDNz3OrnR89k7PW_0ZyMUpKVbt-YlnzqE

29 March – Jaak Aaviksoo, “Enthusiasts` marches will not solve the problems “. Article on the website of Estonian Public Broadcasting. <https://www.err.ee/1608158779/jaak-aaviksoo-entusiastide-marsid-probleeme-ei-lahenda>

24 April – Tarmo Soomere, “Green turn as a matter of science and development of technology”, article in local newspaper “Postimees”.

https://arvamus.postimees.ee/7232195/tarmo-soomere-rohepoore-kui-teaduse-ja-tehnoloogia-arendamise-kusimus?fbclid=IwAR2MFYc7MsdafmL-Q2upZ9QrQiCVsJ_n1ImFMpovQRw3rAKqEk2XPAHhSqE

30 May – Enn Lust, “The role of hydrogen in transport of the future - the hydrogen turn cannot be missed, otherwise Estonia will be Africa”. Interview. Delfi Forte.

<https://forte.delfi.ee/artikkel/93587723/teadusintervjuu-enn-lust-kui-eesti-jaab-vesinikupoordest-korvale-siis-oleme-paras-aafrika>

6 June – Margus Lopp, “Climate crisis and oil shale energetics”. Interview in local media channel Delfi section on science news (Forte).

<https://forte.delfi.ee/artikkel/93658361/intervjuu-teadlasega-margus-lopp-polevkivi-poletamine-on-barbaarsus>

8 June – Jarek Kurnitski, “Ventilation systems”, Interview. Estonian Public Broadcasting "Vikerraadio" <https://vikerraadio.err.ee/1608224830/huvitaja-ventilatsioonisüsteemid>

11 June – Tarmo Soomere, “Global warming and oceans”. Article in local newspaper "Postimees", <https://arvamus.postimees.ee/7269494/tarmo-soomere-kas-kliima-soojenemine-toob-meile-jaaja>

18 June – Tarmo Soomere, “Changes in the climate of our region during the last decades”. Interview. Estonian Public Broadcasting, Radio-channel “Vikerraadio”

<https://vikerraadio.err.ee/1608251400/tarmo-soomere-tormitsuklid-muutuvad-uha-pikemaks>

19 July – Tarmo Soomere, “The probability of flood in Estonia”. Interview. Estonian Public Broadcasting, ETV, Ringvaade. <https://www.err.ee/1608283206/akadeemik-eestis-pole-linnu-minema-uhtuvad-uleujutused-voimalikud>

27 July – Tarmo Soomere, “Climate crisis”. Interview. “Lääne Virumaa uudised”. <https://www.laanevirumaa uudised.ee/uudised/2021/07/26/kliima-soojenemisega-on-eesti-maailmasesirinnas?fbclid=IwAR3KUbuUfcQgDc6vhRELumTsZfwPnirx3PxWTvSbLVINuhNCoAErYVlddf6g>

28 July – Enn Lust, “The clean energy is less expensive in certain areas of the world”. Interview. “Ärileht”. <https://arileht.delfi.ee/artikkel/94128159/kutuseteadlane-maailmas-on-fantastilisi-piirkondi-kus-puhas-energia-juba-on-mustast-odavam>

25 August – Tarmo Soomere and Enn Lust as invited speakers at the Investment conference with a focus on green energy and hydrogen production in Paldiski. Business newspaper “Ärileht”. <https://arileht.delfi.ee/artikkel/94408813/paldiskis-allkirjastati-vesinikualane-heatahte-koostoolepe>

3 September – Martin Zobel, Urmas Kõljalg “Climate change and biodiversity loss are different sides of the same problem” article with an emphasis on the key messages from European Science Academies for UNFCCC COP26 and CBD COP15. [European Academies’ Science Advisory Council \(EASAC\)](https://www.easac.europa.eu/easac/press-releases/2021/09/03/european-academies-science-advisory-council-easac). Sirp <https://www.sirp.ee/s1-artiklid/c21-teadus/kliimamuutus-ja-elurikkuse-havimine-on-uhe-ja-sama-mundi-eri-pooled/>

18 September – Kalle Kirsimäe “Minerals and green turn in Estonia”. Interview. “Virumaa teataja”. <https://arvamus.postimees.ee/7341000/kalle-kirsimae-loplikud-loppematud-maavarad>

pdf on the EAS website: <https://www.akadeemia.ee/wp-content/uploads/2021/10/teadlase-pilguga-kalle-kirsimae-1.pdf>

9 October – Ülo Niinemets “Thicket in the past, present and future”. Article in daily newspaper “Postimees” <https://arvamus.postimees.ee/7357252/ulo-niinemets-vosaminevik-tanapaev-ja-tulevik>

pdf on the EAS website <https://www.akadeemia.ee/wp-content/uploads/2021/10/teadlase-pilguga-ulo-niinemets.9.10.21.pdf>

16 October – Tarmo Soomere „From chaos to reliable prognosis”. Article in daily newspaper „Postimees”. <https://arvamus.postimees.ee/7362577/tarmo-soomere-kaoset-usaldusvaarseprognoosini?fbclid=IwAR3NveRv0enK3rfdzE88rcBty5gTpD6jtEGTXiHUd8FGgrkXzwNwEsLMdwU>

pdf on the EAS website <https://www.akadeemia.ee/wp-content/uploads/2021/11/teadlase-pilguga-tarmo-soomere.16.10.21.pdf>

21 October – Jaak Aaviksoo and Veiko Uri - invited speakers at the Forest conference. Estonian Forest and Wood Industries Association (EFWIA). Pre-information about the conference in the weekly newspaper “Maaleht”:

<https://maaleht.delfi.ee/artikkel/94581445/metsakonverents-metsatoostuse-panus-rohepoorde-ja-kliimaneutraalsuse-saavutamisel>

30 October – Jarek Kurnitski “Green turn and natural change in human behaviour”. Article in daily newspaper “Postimees”. <https://arvamus.postimees.ee/7373985/jarek-kurnitski-rohepoordest-ja-harjumuste-loomulikust-muutumisest>

pdf on the EAS website <https://www.akadeemia.ee/wp-content/uploads/2021/11/teadlase-pilguga.-jarek-kurnitski.30.10.21.pdf>

5 November – Enn Lust “Energy crisis is worse than the Covid-19 crisis”. Article in daily newspaper “Postimees”. <https://tartu.postimees.ee/7378241/akadeemik-enn-lust-energiakriis-on-koroonast-hullem>

6 November – Tarmo Soomere „Forest in the focus of climate discussions”. Article in daily newspaper “Postimees”. <https://arvamus.postimees.ee/7379230/tarmo-soomere-mets-kliimadiskussiooni-fookuses?fbclid=IwAR1tf3cnmAJ8FPSJxymIme8LuX3ZVpGs8IZY5wYjz6mci7a5xXGYvt0yXQ>

pdf on the EAS website <https://www.akadeemia.ee/wp-content/uploads/2021/11/teadlase-pilguga.-tarmo-soomere.6.11.21.pdf>

12 November – Tarmo Soomere “Excellent advice does not have to be expensive”. Article in weekly newspaper “Sirp”. <https://sirp.ee/s1-artiklid/c21-teadus/hea-nou-ei-pruugi-olla-kallis/>

19 November – Tarmo Soomere “Estonian options in preserving the biodiversity and climate”. Article in weekly newspaper “Sirp”. <https://www.sirp.ee/s1-artiklid/c21-teadus/eesti-valikud-elurikkuse-ja-kliima-hoiul/>

23 November – Tarmo Soomere “Impact of global warming on coastal cities and migration in the long term”. Estonian Public Broadcasting, ETV, Ringvaade.

<https://etv.err.ee/1608400100/ringvaade> interview starts at 8 minutes 47 seconds.

Part 4 Conference presentations and scientific publications

Conference presentations:

25 August - Enn Lust “Hydrogen in transport, modern industry and central heating”.

<https://investinpaldiski.ee/wp-content/uploads/14-1-Enn-Lust.pdf>

Investment conference “A different kind of Paldiski”. <https://investinpaldiski.ee/en/conf-2021/>

25 August – Tarmo Soomere “The energy of the future as a combination of smart production, smart use and efficient storage “. Investment conference “A different kind of Paldiski”. <https://investinpaldiski.ee/en/conf-2021/>

26 August - Enn Lust, “Wind energy and hydrogen production on Baltic Sea”. Conference “Baltic Sea Day”. <https://www.tallinn.ee/est/keskkond/Baltic-Sea-Day-2021-programme>

16 September – Tarmo Soomere “The present and future of the “climate” of extreme water levels in Latvian and Lithuanian waters”. President Tarmo Soomere, Presentation at the meeting of the Department of Biology, Medicine and Earth Sciences of the Lithuanian Academy of Sciences. <http://www.lma.lt/news/1315/38/Susitikimas-su-LMA-uzsienio-nariais-nuo-Tokijo-iki-Reikjaviko>

21 October – Jaak Aaviksoo and Veiko Uri - invited speakers at the Forest conference organized by weekly newspaper “Maaleht” in cooperation with the Estonian Forest and Wood Industries Association (EFWIA).

8 November – Tarmo Soomere as invited expert in the panel discussion of the COP 26 conference in Glasgow.

<https://www.gov.uk/government/publications/statement-by-international-scientific-advisers-ahead-of-cop26> panel: <https://www.youtube.com/watch?v=r-EXwYKm1Ss>

Scientific publications:

Jüri Engelbrecht:

- Engelbrecht, J., Kitt, R. Knowledge generation and interdisciplinarity. – Cadmus, 2021, 4 (5). <https://cadmusjournal.org/article/volume-4/issue-5/knowledge-generation-and-interdisciplinarity>

Kalle Kirsimäe:

- Lumiste, K., Lang, L., Paiste, P., Lepland, A., Kirsimäe, K. Heterogeneous REE+Y distribution in Early Paleozoic shelly phosphorites: implications for enrichment mechanisms. – Chemical Geology, 2021, 586, 120590. DOI: 10.1016/j.chemgeo.2021.120590

Jarek Kurnitski:

- Kuivjõgi, H., Uutar, A., Kuusk, K., Thalfeldt, M., Kurnitski, J. Market based renovation solutions in non-residential buildings – why commercial buildings are not renovated to NZEB. – Energy and Buildings, 2021, 248, 111169. DOI: 10.1016/j.enbuild.2021.111169
- Simson, R., Thomsen, K. E., Wittchen, K. B., Kurnitski, J. A Comparative Analysis of NZEB Energy Performance Requirements for Residential Buildings in Denmark, Estonia and Finland. – E3S Web of Conferences: Cold Climate HVAC & Energy 2021: Cold Climate HVAC & Energy 2021, Tallinn, Estonia, April 18-21, 2021. – E3S Web of Conferences, 2021, 246, 1–12. DOI: 10.1051/e3sconf/202124614001

- Simson, R., Thomsen, K. E., Wittchen, K. B., Kurnitski, J. NZEB Requirements vs European Benchmarks in Residential Buildings. – *Rehva Journal*, April 2021, 40–44. <https://www.rehva.eu/rehva-journal/chapter/nzeb-requirements-vs-european-benchmarks-in-residential-buildings>
- Vösa, K.-V., Ferrantelli, A., Tzanev, D., ..., Kurnitski, J. Building performance indicators and IEQ assessment procedure for the next generation of EPC-s. – *E3S Web of Conferences*, 2021, 246, 13003. DOI: 10.1051/e3sconf/202124613003.

Enn Lust:

- Eskusson, A., Thomberg, T., Romann, T., Lust, K., Lust, E., Jänes, A. Zn(ClO₄)₂ aqueous solution-based Zn thin foil|carbon cloth two-electrode single-cell characteristics. – *Journal of Solid State Electrochemistry*, 2021, 25, 2869–2880. DOI: 10.1007/s10008-021-05028-3
- Jäger, R., Teoor, P., Paalo, M., ..., Lust, E. Synthesis and characterization of cobalt and nitrogen co-doped peat-derived carbon catalysts for oxygen reduction in acidic media. – *Catalysts*, 2021, 11, 715. DOI:10.3390/catal11060715
- Jürjo, S., Siinor, L., Siimenson, C., Paiste, P., Lust, E. Two-step solvent extraction of radioactive elements and rare earths from Estonian phosphorite ore using nitrated Aliquat336 and Bis(2-ethylhexyl) phosphate. – *Minerals*, 2021, 11, 388. DOI: 10.3390/min11040388

Ülo Niinemets

- Kelly, R., Healy, K., Anand, M., ..., Niinemets, U., *et al.* Climatic and evolutionary contexts are required to infer plant life history strategies from functional traits at a global scale. – *Ecology Letters*, 2021, 24 (5), 970–983. DOI: 10.1111/ele.13704.
- Laughlin, D.C., Mommer, L., Sabatini, F.M., ..., Niinemets, U. Root traits explain plant species distributions along climatic gradients yet challenge the nature of ecological trade-offs. – *Nature Ecology & Evolution*, 2021, 5, 1123–1134. DOI:10.1038/s41559-021-01471-7
- Niinemets, Ü., Rasulov, B., Talts, E. CO₂-responsiveness of leaf isoprene emission: why do species differ? – *Plant, Cell & Environment*, 2021, 44 (9), 3049–3063. DOI:10.1111/pce.14131
- Pinho, B.X., Tabarelli, M., ter Braak, C.J.F., ..., Niinemets, U., *et al.* Functional biogeography of Neotropical moist forests: Trait-climate relationships and assembly patterns of tree communities. – *Global Ecology and Biogeography*, 2021, 30 (7), 1430–1446. DOI:10.1111/geb.13309

Veiko Uri:

- Aun, K., Kukumägi, M., Varik, M., Becker, H., Aosaar, J., Uri, M., Buht, M., Uri, V. Short-term effect of thinning on the carbon budget of young and middle-aged silver birch (*Betula pendula* Roth) stands. – *Forest Ecology and Management*, 2021, 480, 118660. DOI:10.1016/j.foreco.2020.118660
- Aun, K., Kukumägi, M., Varik, M., Becker, H., Aosaar, J., Uri, M., Morozov, G., Buht, M., Uri, V. Short-term effect of thinning on the carbon budget of young and middle-aged Scots pine (*Pinus sylvestris* L.) stands. – *Forest Ecology and Management*, 2021, 492, 119241. DOI:10.1016/j.foreco.2021.119241

Professor Veiko Uri, summary of two recent publications: Carbon (C) sequestration has been highlighted in consequence of climate changes and increased CO₂ content in the atmosphere. Forest management is one essential factor which strongly affects C sequestration capacity of stands. In the present two papers, the short-term effect of thinning was studied on the ecosystem C cycling in silver birch and Scots pine stands.

In addition to scientific publications on areas of research directly related to climate crisis several publications were published on fundamental sciences and areas of research with implicit impact.