

News from Deep Geothermal IWG, Clean Energy Transition Partnership and GEOTHERMICA

26 November 2020

PRESENTED ON BEHALF OF THE DG-IWG BY **GERDI BREEMBROEK** (NETHERLANDS ENTERPRISE AGENCY, 2021 CHAIR)



Cabinet:

- Gerdi Breembroek NL Chair 2021
- Inga Berre EERA Co-chair
- Fausto Batini ETIP-DG Co-Chair
- Gunter Siddiqi CH Chair 2020

What has been going last half year?

- ▶ IWG Deep Geothermal
 - ▶ Implementation Working Plan revision
- ▶ Preparations Horizon Europe
 - ▶ Clean Energy Transition Partnership
 - ▶ Linking up with GeoERA
- ▶ GEOTHERMICA
 - ▶ Some GEOTHERMICA-2 projects already kicked off
 - ▶ Preparations third joint call started

IWG R&I priorities – as in revision

- A. Geothermal heat in urban areas
- B. Integration of geothermal electricity and heating & cooling in the energy system responding to grid and network demands
- C. Improvement of overall geothermal energy conversion performance for electricity and heating & cooling generation
- D. Closed loop electric and heating & cooling plants integrated in the circular economy
- E. Methods, processes, equipment and materials to ensure the steady availability of the geothermal resources and improve the performance of the operating facilities
- F. Development and exploitation of geothermal resources in a wider range of geological settings

- G. Advanced drilling/well completion techniques
- H. Innovative exploration techniques for resource assessment and drilling target definition

NON-TECHNICAL BARRIERS/ENABLERS (NTBE)

- A. Increasing awareness of local communities and involvement of stakeholders in sustainable geothermal solutions
- B. Risk mitigation (financial/project)

CROSS-CUTTING

- ▶ Knowledge transfer + training
- ▶ Recommendation of an open-access policy to geothermal information

IWP: Targets

1. Increase reservoir performance* in sustainable yield predicted for at least 30 years and reduce the power demand of operating facilities to below 10% of gross energy generation by 2030
2. Improve the overall geothermal energy conversion efficiency, including bottoming cycle, of geothermal installations at different thermodynamic conditions by 10% in 2030 and 20% in 2050
3. Ensure production costs (CAPEX and OPEX) of geothermal energy (including from unconventional resources, EGS, and/or from hybrid solutions which couple geothermal with other renewable energy sources) below 10 €/ct/kWhel for electricity and 5€/ct/kWhth for heat by 2025**
4. Demonstrate the technical and economic ability of innovative exploration approaches and tools to increase the drilling success rate by 20% in 2025 and 50% in 2030 compared to 2015;
5. Reduce the unit cost of drilling (€/MWh) by 15% in 2025, 30% in 2030 and by 50% in 2050 compared to 2015;
6. Demonstrate the technical and economic feasibility of responding to commands from a grid operator, at any time, to increase or decrease output ramp up and down from 60% - 110% of nominal power or heat production;
7. **Demonstrate the technical and economic feasibility of geothermal heating, cooling and high-temperature storage in a flexible heating system; cover 5% of demand in Europe by 2030 and 25% by 2050.**

Clean Energy Transition Partnership at a glance

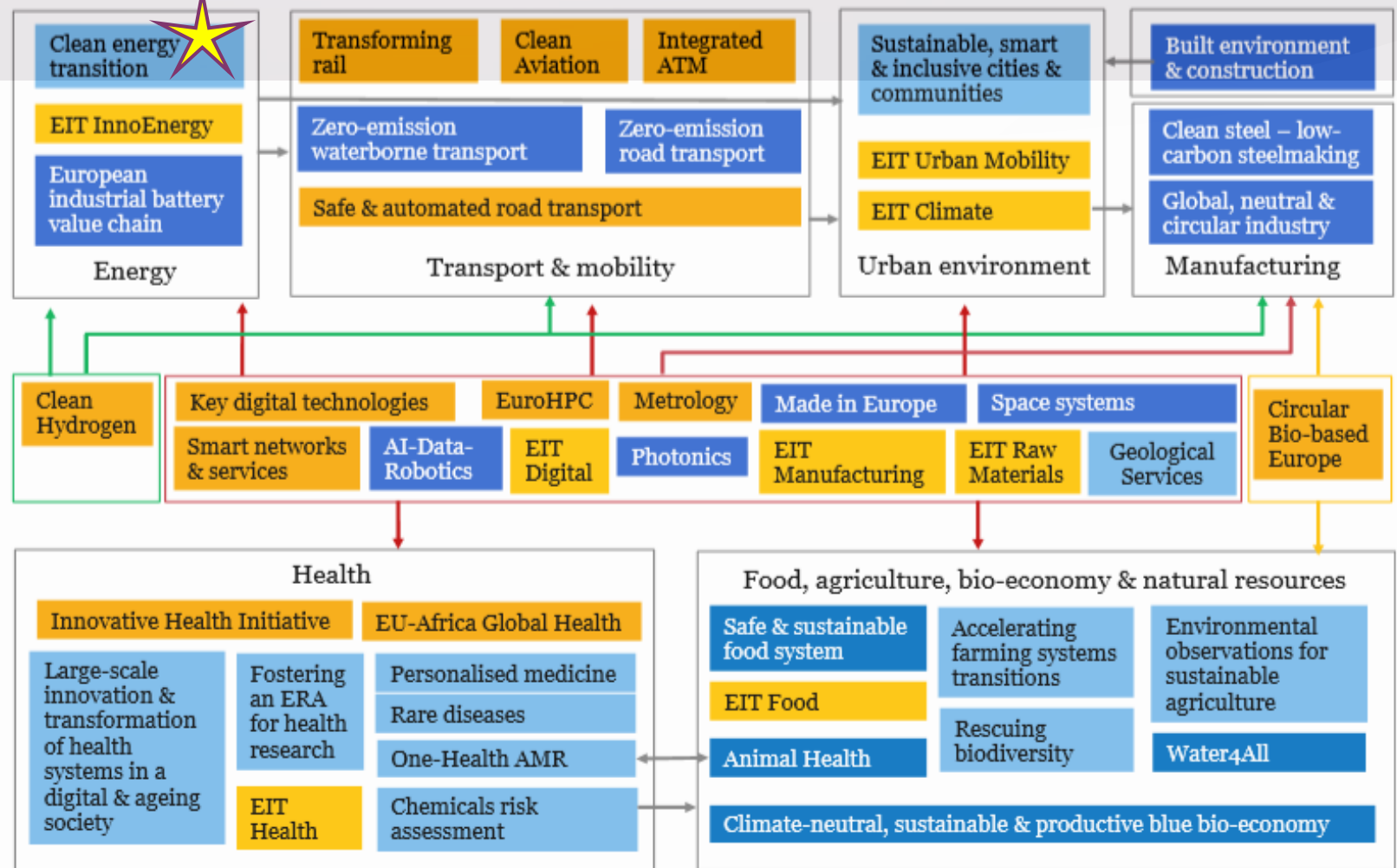
- ▶ 'Co-funded Partnership under Horizon Europe'
- ▶ Collaboration of funding organisations (Ministries, R&I funders)
- ▶ From all EU Member countries, Associated countries, and beyond
- ▶ Financial support from Horizon Europe/European Commission
- ▶ Operation similar to ERANET Cofund in H2020 (e.g. GEOTHERMICA)
- ▶ CETP will organise joint calls and accompanying activities
- ▶ Stimulating R&I projects and joint learning
- ▶ **23 November 2020: Strategic Research and Innovation agenda at SET Plan Conference**
- ▶ 2021: establishment of CETP
- ▶ 2022: first joint call(s)

Clean Energy Transition Partnership: One ★ of 48 possible partnerships in Horizon Europe

Industry-orientated
'vertical'
partnerships

'Horizontal'
partnerships

Vertical partnerships in
the societal application
areas



Technopolis Group

Candidate Institutionalised Partnerships

EIT KIC

Co-Programmed

Co-Funded

CPP or CFP

Deep GEOTHERMAL IVG

CETP Core Team



Michael Hübner (AT)

- Ministry of Climate Action
- Chair of SET-Plan IWG 4
- Coordinator Joint Programming Platform Smart Energy Systems (ERA-Net co-funds Smart Grids Plus, RegSys and EnerDigit)



Lisa Lundmark (SE)

- Swedish Energy Agency
- International Coordinator, Research and Innovation, Swedish expert for Cluster 5 Climate, Energy and Mobility in Horizon Europe, and alternate for Sweden in the SET-Plan Steering Group and SET-Plan Bureau



Hans-Günther Schwarz (AT)

- Ministry of Climate Action
- Member of SET-Plan Steering Group and SET-Plan Bureau
- Chair of SET-Plan IWG 3.2
- Coordinator JPI Urban Europe



Gunter Siddiqi (CH)

- Swiss Federal Office of Energy
- Swiss delegate in the SET-Plan SG, the ERANETs GEOTHERMICA (geothermal energy) and ACT (CCUS); he chairs the Deep Geothermal Implementation Working Group.



Fredrik Lundström (SE)

- Swedish Energy Agency
- Representing Sweden in the SET-plan IWG4 and acting as co-chair of the joint programming platform ERA-NET Smart Energy Systems together with Michael Huebner, Austria.



Ragnhild Rønneberg (NO)

- Research Council of Norway
- Coordinator of ERANET ACT



Rachele Nocera (IT)

- ENEA (Italian National Agency for new technologies, energy and sustainable economic development)
- expert in EU policy and initiatives on energy and energy technologies; Sherpa to Italian Set Plan representatives; management board of the ETIP Batteries Europe



Cagri Yildirim (TR)

- TÜBİTAK – the Scientific and Technological Research Council of Turkey
- scientific programmes expert. Representing Turkey in the SET-Plan SG, H2020 Energy Programme Committee and ERA-Net Enerdigit.



Gerdi Breembroek (NL)

- Netherlands Enterprise Agency
- Dutch representative in ERANET ACT and GEOTHERMICA, Co-Chair of Deep Geothermal IWG, IEAGHG delegate



Ruben Prins (NL)

- Ministry of Economic Affairs and Climate
- Senior Policy officer energy innovation



Ute Micke (DE)

- Projektträger Jülich, Germany
- Energy and Climate, Energysystem Integration (ESI)
- National Contact Point Energy



Susanne Meyer (AT)

- Austrian Institute of Technology
- Support for Austrian Ministry of Climate Action



Reijo Munther (FI)

- Business Finland
- Chief Adviser

CETP in a broader policy context

UN Sustainable Development Goals



EU Climate Ambition

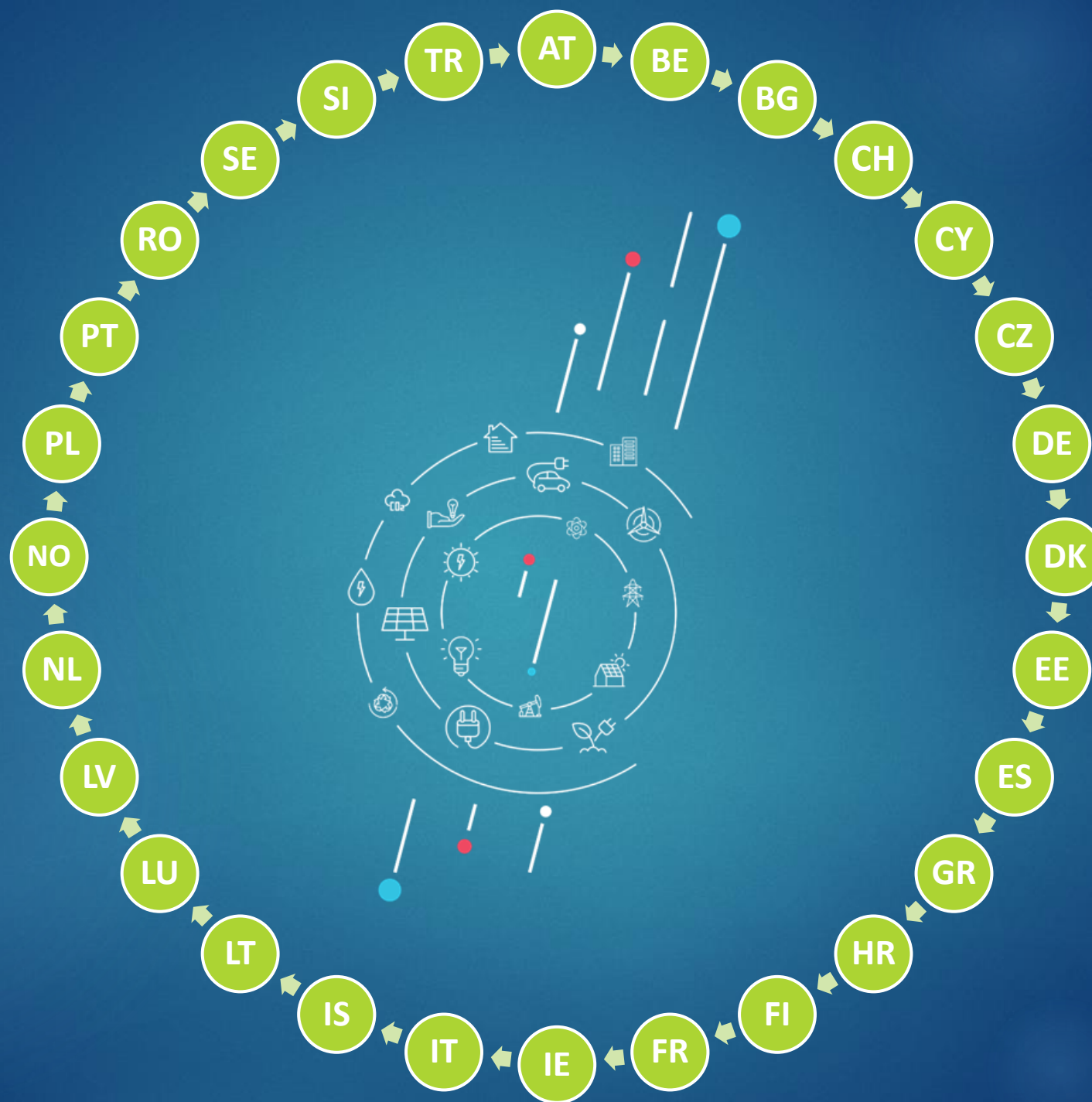
- A Clean Planet for All
- The European Green Deal
 - Energy System Integration strategy and Hydrogen Strategy
 - Renovation Wave strategy
 - Off shore Renewable Energy strategy
 - Biodiversity strategy
- National Energy and Climate Plans
- EU Competitiveness Progress Report
- Recovery and Resilience Facility, within the Next Generation EU Programme
- EU Taxonomy

RDI for the clean energy transition

- A new European Research Area (ERA)
- European Strategic Energy Technology Plan (SET Plan)
- International Collaboration: Mission Innovation and the International Energy Agency

28 countries who indicated their interests to participate in and allocate budget to the CETP

Indicated budget contribution of Member states and Associated countries
~ 500 million €
(16 November 2020)



Rationale for SRIA and CETP Challenges

- ▶ **guidance and “compass” for the next 10 years**
- ▶ **keystone for the implementation** of the CETP
- ▶ follow a **challenge-driven approach**
- ▶ focus on the **contribution that multilateral collaboration** can make
- ▶ **portfolio of challenges**
 - ▶ **reasonable number**
 - ▶ **provide structure with synergies and interlinks**
- ▶ follow the request from countries to consider
 - ▶ **enabling technologies**
 - ▶ **system integration aspects**

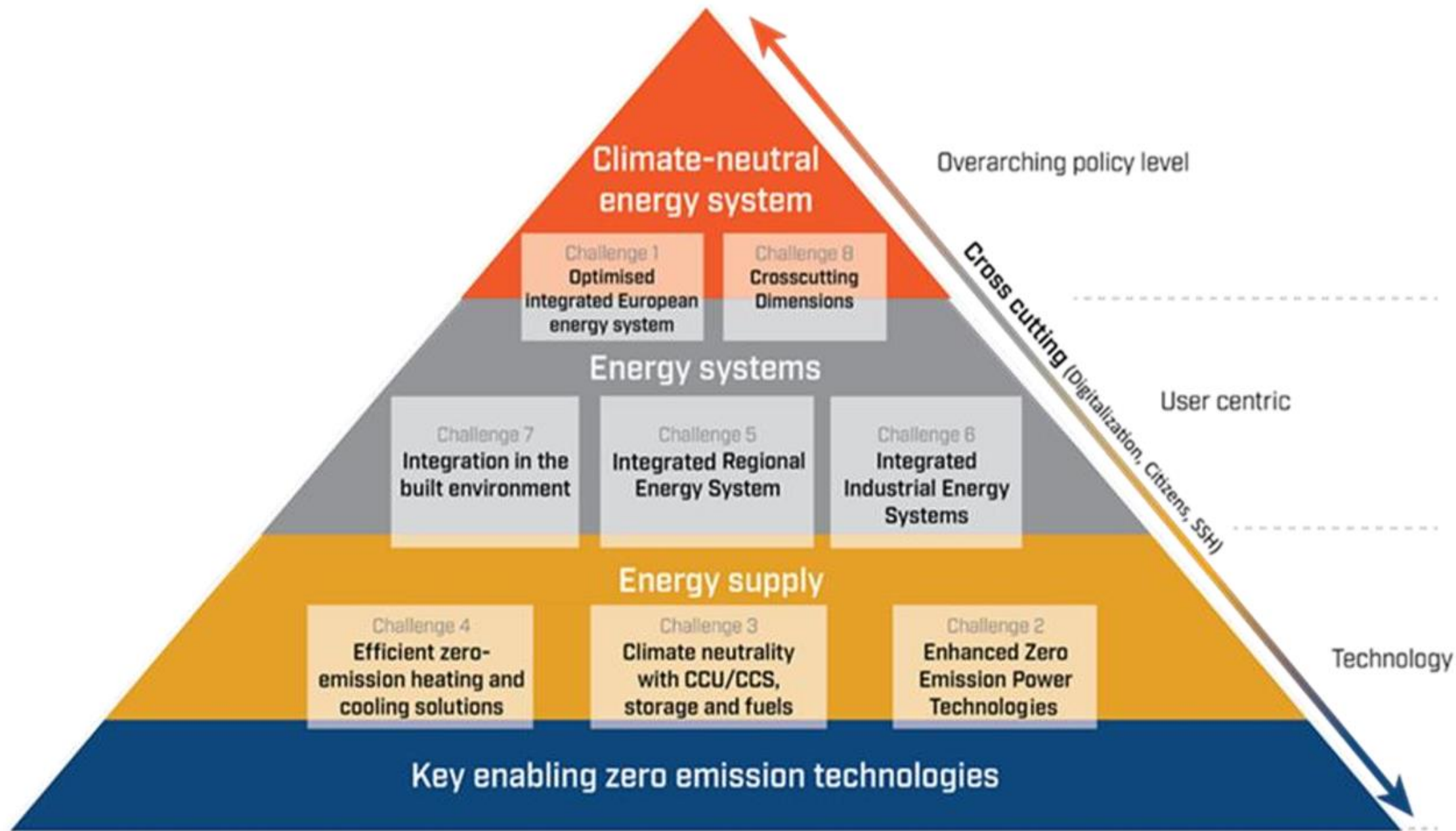


Figure 3 From enabling technologies towards and integrated energy system

Heating and cooling crucial for Europe

- ▶ Half of the energy demand in Europe
- ▶ Seasonal demand pattern
 - ▶ Variations are huge compared to electricity

Geothermal can contribute

- ▶ Space heating and cooling
- ▶ Process heat for industrial processes

Figures: M. Victoria, K. Zhu, et al, Energy Conversion and Management 201 (2019) 111977

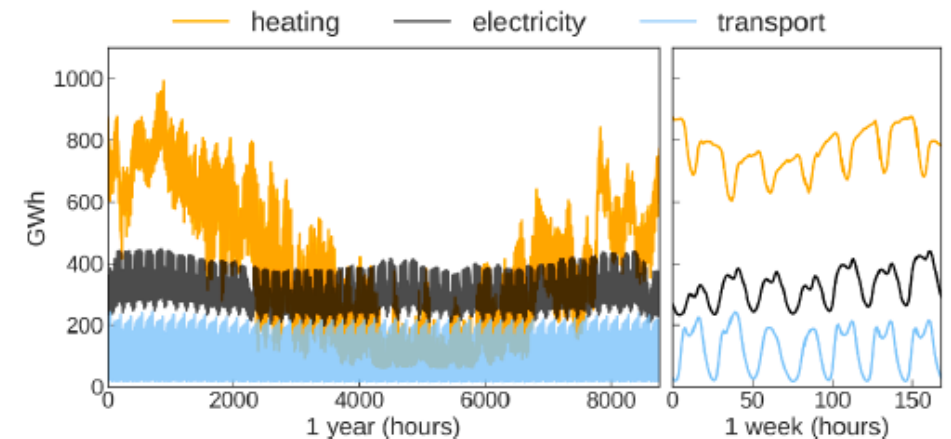
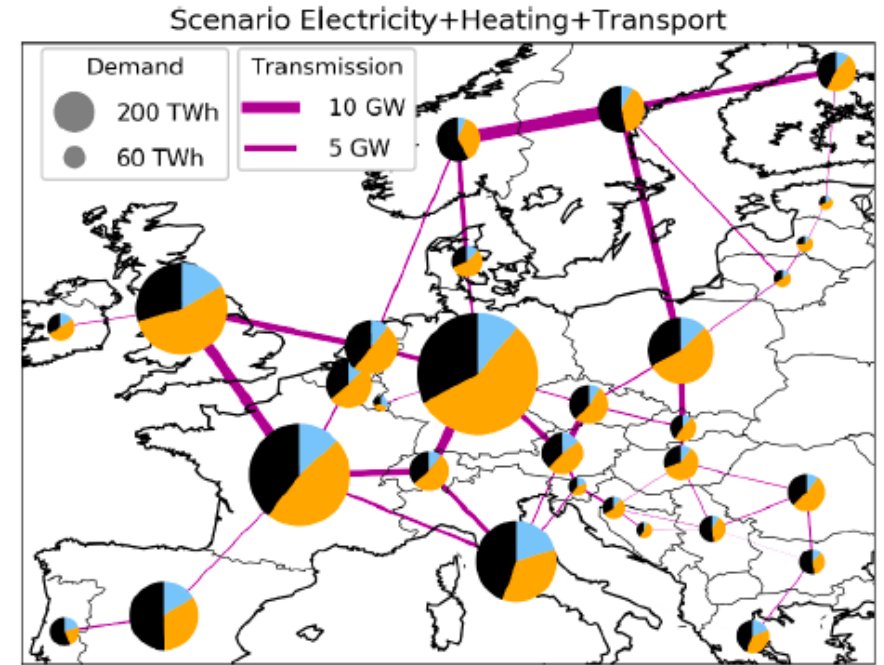


Fig. 2. (top) Spatial plot showing the energy demand per sector and country. (bottom) Europe-aggregated demand for the different sectors. Demands are estimated based on historical data, see Appendix B.

GEOHERMICA, and ERANET Smart Energy Systems and GEOHERMICA collaboration

Ongoing preparations for joint Calls

- ▶ **GEOHERMICA-3 call: preparations started**
- ▶ Also, ERANET Smart Energy Systems and GEOHERMICA have joined forces
- ▶ Paving the way for CETP
- ▶ **GEOHERMICA/SES: Accelerating the heating and cooling transition through innovation”**
- ▶ Scoping workshop on 16 October 2020, follow-on meeting 20 November
- ▶ Funding organizations only
- ▶ Aim: Joint call in 2021

Thank you for your attention!