

Fall 2023

# HIGH-LEVEL POLICY CONFERENCE

Researching energy pathways to a resilient and net-zero society

Launching EERA's flagship report on **Energy Demand Reduction** and policy analysis on **Critical Raw Materials** 





# **INTRODUCTION**

As the crucial and urgent nature of the Clean Energy Transition becomes increasingly apparent on a global scale, EERA firmly asserts that the research community must play a decisive role in both supporting stronger EU industrial leadership in low-carbon technologies and defining key transition pathways that work towards safeguarding a socially just, environmentally sustainable, and ethically uncompromised future.

As such, EERA's 2023 flagship High-Level Policy Conference tackled two critical and timely pillars of clean energy research: energy demand reduction and access to critical raw materials. EERA flags these topics as essential factors in the advancement toward a resilient and net-zero society.

Accordingly, the panel discussions of the conference, rooted in the two thematic pillars of the event, provided perceptive, comprehensive, and policy-focused insights into furthering the current dialogue on how to bring Europe closer to climate neutrality.

# **EVENT SUMMARY**

## **Opening remarks**

Nils Røkke - President, EERA

Within the context of EERA's fifteen years in action, the launching of the dual milestone reports is telling at a time when there is a great need to further the discussions on both reducing energy demand and securing crucial and necessary technological development as we look to the future.

'Nothing' is possible, meaning zero is possible. Catalysing European energy research to achieve a net-zero society by 2050 is what motivates the work of EERA.

The possibility of achieving this net-zero goal has been amplified in recent years by the growth of key technologies, such as electric car sales and solar PV, but the key question remains: is this enough?

The direction of clean energy developments is positive; however, the speed of their development remains a challenge. This is where EERA plays a critical role in advancing technological research to ensure rapid deployment on the market.

Furthermore, the issue of dependence in Europe must also be acknowledged, with debate and uncertainty surrounding the possibility that the bloc is shifting from being dependent on Russian gas to being dependent on critical materials from Asia.



Finally, it must be asked, can growth solve everything? Limitations to growth is a heavily debated topic in the energy ecosystem, and energy demand reduction is gradually becoming a critical facet of this discussion.

## First keynote speech

Salla Saastamoinen - Deputy DG, JRC, European Commission

The European Commission and the European Union are strongly committed to ensuring the 1.5°C target stays within reach.

The European Green Deal regulatory framework has experienced a fast-tracked path over the last three years. However, when it comes to the implementation of these policies, the cooperation of EERA and the wider energy research community is needed.

In addition, the EU is leading the way in many key areas of clean energy research. Nevertheless, although investment in R&I is growing, it continues to remain too low. It is important to address such barriers as they are factors contributing to the holding back of many start-ups and scale-ups in this area.

Furthermore, it must be noted that "the energy transition is a material transition, and large-scale deployment comes with questions of sovereignty and sustainability for the EU" when competing in the global economy.

In order to make the clean energy transition successful, a multidisciplinary approach with researchers from many areas, including natural and environmental scientists, biologists, sociologists, and economists, is absolutely crucial.

The energy transition is a material transition, and large-scale deployment comes with questions of sovereignty and sustainability for the EU.

Salla Saastamoinen - Deputy DG, JRC, European Commission

### Second keynote speech

Sandrine Dixson-Declève - Co-president, Club of Rome

International efforts to fight the climate crisis have remained focused on the supply side and technological solutions and do not adequately factor in perversities in the markets and economic social systems.



There is a need to stop ignoring the inherent wastefulness of global production and consumption patterns, especially in the North, and consider demand-side measures to bring the world closer to the essential questions of responsibility and equity.

Poverty and inequality will hinder any potential to reach common objectives concerning planetary boundaries. It is not feasible or equitable to continue to have profits in the food or the energy sectors on the back of food and energy poverty.

Such growing tension can create a dramatic shift towards populistic governments that will not respect democracies nor the objectives of climate change mitigation, ecosystem preservation, and social protection.

There is a clear need to diversify essential sources for critical materials in order to avoid dependence on relations with autocratic governments and others that may use the access to such materials to create real disruption across global value chains.

Accelerating the substitution of costly, imported products through regional and renewable resources is crucial. Furthermore, reducing final demand for increasingly costly resources and products is one of the best solutions in acknowledging the limits to growth.

"This is a decisive decade; there is no time for complacency, but there is also no time for despair."

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Sandrine Dixson-Declève - Co-president, Club of Rome

## Third keynote speech

Philippe Lamberts - Member of the EP, CO-President of the Greens/EFA in the Parliament

In a world where growth seems to be the mantra, it is not commonplace to bump into people ready to discuss energy demand reduction.

The launch of the European Green Deal by Ursula von der Leyen was a welcomed change. Moreover, the fact that this deal was central in the response to both the Covid crisis and the Russian war against Ukraine was also a good sign.



In particular, it was remarkable to see a target of reducing our energy consumption by the end of the year in reaction to the war, a target which was even beaten by some countries. Such a scenario highlights that energy is, in fact, being wasted in Europe. The way in which it was that easy to reduce energy demand by 15% without lowering production by the same amount highlights the existence of quite an amount of low-hanging fruits in terms of energy reduction.

However, there is also a form of denial in political majorities regarding planetary boundaries. Not only do limits exist on the amount of CO2 that can be released into the atmosphere, but there are also limits to the amount of lithium, cobalt, and copper on this planet, meaning tough choices will need to be decided on.

The link EERA makes between resilience and energy demand reduction is key. If societies are to become resilient, a more cautious approach to how energy is used is essential, a concern not yet shared across the political landscape.

Ultimately, it must be realised that the fossil fuel era was a parenthesis and therefore, choices are necessary to ensure that the planetary boundaries are respected.

### Fourth keynote speech

#### Paula Pinho - Director, DG ENER, EU Commission

The topics chosen for today's High-Level Policy Conference are critically important in bringing about the clean energy transition.

Within the EU, energy demand reduction is key in reducing emissions by at least 55% by 2030. The European Commission is not interested in 'demand destruction,' which would result in the loss of essential industrial capacity and output. Instead, it is working towards structural efficiency gains.

Everyone's contribution is vital. Researchers, innovators, industry, and households are all decisive players when it comes to seizing the potential for energy efficiency.

Furthermore, EERA's choice to focus on the thematic pillar of critical raw materials is timely. The access to sustainable and secure critical raw materials will be absolutely crucial in ensuring the development of the clean energy technologies needed for a decarbonised energy system.

When it comes to strengthening Europe's critical raw material capacity along all stages of the value chain, EERA's research is essential in allowing for sustainable and circular production.

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Paula Pinho - Director, DG ENER, EU Commission

## Presentation: Energy Demand Reduction as part of the Clean Energy Transition in Europe

Adel El Gammal - Secretary General, EERA

Globally, 90% of primary energy demand relies on fossil fuels. Furthermore, thus far, demand reduction has solely been used to address fossil fuels in times of crisis.

However, in order to decarbonise the economy and reach climate neutrality, EERA's report on energy demand reduction asserts that all efforts to both deploy existing renewable technologies and research for new, efficient, and cost-effective technologies must be conducted in parallel with addressing the demand side, most principally by reducing energy demand across all sectors.

In addition, evidence illustrates that, in developed economies, long-term and structural energy demand reduction is possible without compromising the level of well-being.

Reducing energy demand also has several key benefits, including decreasing environmental risk, reducing the Clean Energy Transition (CET) cost, easing geopolitical pressures, and addressing limitations of circularity and digitalisation.









- 1. Nils Røkke, President, EERA
- 2. **Adel El Gammal,** Secretary General, EERA
- 3. **Salla Saastamoinen**, Deputy DG, JRC, European Commission
- 4. Sandrine Dixson-Declève, Copresident, Club of Rome
- 5. **Philippe Lamberts,** Member of the EP, CO-President of the Greens/EFA in the Parliament





# Panel discussion 1: The vital role of energy demand reduction in Europe's Clean Energy Transition

The first discussion analysed the importance of long-term strategies for reducing energy demand in Europe. The conversation, rooted in the insights and discussions that took place throughout the conference on the broader Clean Energy Transition (CET), included crucial inputs from panellists: Hélène Chraye, Guillermo Borragán Pedraz, Tiina Koljonen, and Camille Defard.

#### Hélène Chraye - HoU, DG RTD, EU Commission

In opening the conversation on both the importance of energy demand reduction and its place in the wider clean energy strategy, it is necessary to acknowledge that, despite enormous progress, technologies will not solve all challenges, particularly if this technology is not adjusted to the needs of people. In order to reduce energy demand, taking into account the human dimension is critical.

#### "We need to embed social needs into the development of technologies."

A regulatory framework is not enough; change is necessary in how technologies are proposed to ensure that people's needs are incorporated. If technology does not meet people's needs, it is not an effective tool.

We need to embed social needs into the development of technologies.

#### Guillermo Borragán Pedraz - R&D Project Manager, VITO/EnergyVille

All messages of this EERA High-Level Policy Conference highlight the existence of a climate emergency on a global scale.

Europe is not on track to meet its agreed Paris targets, so something more needs to be done.

Energy demand reduction strategies can save up to 30% of the energy consumed in the built environment.

In addition, the wealthiest 10% are responsible for 50% of emissions. Therefore, a potential solution exists in balancing consumption.



This can be done by establishing maximums of consumption, for example, thus allowing poorer energy households, often in scenarios of under-consumption and negatively affected well-being, to consume more.

Demand reduction requires a structured, inter-connected, system-level change that brings together various actions and measures across Europe.

Energy demand reduction is not new. However, what is new is researchers' enhanced understanding of the mechanisms of human behaviour. As such, now is the time to maximise reduction strategies.

#### Tiina Koljonen - Research Team Leader, VTT

At a member state level, there is a clear need for demand reduction strategies when looking at a sustainable future and the Clean Energy Transition.

When it comes to how research plays a role in the debate on demand reduction, and as has been highlighted throughout the conference, enhanced multidisciplinary, interdisciplinary, and cross-disciplinary work and approaches to problem-solving must be present.

Furthermore, outside-the-box thinking is needed for energy demand reduction, and it is essential to incorporate the younger generation when researching and finding solutions.

#### Camille Defard - Head of the Jacques Delors Energy Center

Energy sufficiency, a key focal point of EERA's demand report, is focused not only on reducing energy demand but also on reducing the use of natural materials, land, and water.

It is necessary to acknowledge that the global energy system was built in an era of abundant and cheap supply. Now, the world is entering a period of scarcity; therefore, a window of opportunity exists to make energy use a top political priority.

Following this, existing inequality in energy demand, use, and access must be considered. As such, within the concept of sufficiency, it is urgent to recognise distributive aspects of climate policies.

# Furthermore, democracy, governance, and financing are three key components for implementing EU policies in practice.

More collaboration is also needed on a horizontal level across stakeholders, including public, private, and civil society, in order to find solutions within the current uncertain landscape as society transitions away from fossil fuels.





Panel discussion 1: The vital role of energy demand reduction in Europe's Clean Energy Transition



# Presentation: Securing sustainable critical raw materials (CRM) supply for clean energy in Europe

Adel El Gammal - Secretary General, EERA

When speaking on critical raw materials, taking a global, geopolitical approach is necessary.

In this context, the EU's trade dependency on China is highly apparent when looking at the key technologies needed for the Clean Energy Transition. China is leading in many crucial critical materials in which the country processes 90% of the world's production of rare earth. It will be extremely difficult for Europe to catch up both in terms of competitiveness and capabilities.

The EERA policy analysis highlights the key risks in the global context of CRMs. In addition, this research report also focuses on looking for the substitution of these critical materials, alternative materials, and materials sufficiency, all of which are essential not only from a strategic perspective but also in terms of managing global planetary resources.

Finally, the five fundamental CET technologies addressed in this CRM policy analysis include Solar PV, Wind, Hydrogen, Batteries, and Power Electronics.

# Panel discussion 2: Securing critical raw materials - R&I's role in advancing EU's strategic autonomy and the clean energy transition

The second panel discussed the main challenges and opportunities in securing a sustainable supply of critical materials for Europe's clean energy sector. Four panelists (Daniel Cios, Sawako Nakamae, Philippe Jacques, and Reinhilde Veugelers) provided insightful and thought-provoking ideas on the topic at hand.

#### Daniel Cios - Policy Officer, DG GROW, EU Commission

In addressing key critical raw materials challenges, the role of research and innovation is crucial for securing and diversifying the source of both primary and secondary raw materials.

In terms of EU CRM dependence, from the Commission's perspective, key benchmarks have been included in the Net Zero Industry Act to measure how Europe can become a more autonomous actor.



#### Dr. Sawako Nakamae - Research Engineer, CEA

The Net Zero Industry Act highlights that in the future, "we need to depend on technologies that do not exist yet."

Following this, of all the new materials being researched, only 2% make it to products. In addition, the average timeframe to come to fruition is between ten and fifteen years. The world does not have that much time, and huge acceleration is needed.

Furthermore, a gap exists between international priorities and more targeted, attainable research priorities at a national level. In this context, there is a need for greater involvement of national-level incentives which can be adapted to fit local priorities.

Although many advancements can be made in reducing Europe's CRM supply dependencies, for example, recycling and hydrogen, it will be challenging to become fully autonomous if at all possible.

We need to depend on technologies that do not exist yet.

)r. Sawako Nakamae - Research Engineer, CEA

#### Philippe Jacques - Managing Director, EMIRI

From an environmental and labour perspective, a critical need exists to develop sustainable CRM value chains aligned with EU policy criteria.

Furthermore, advanced materials can be viewed as one of the key solutions to reducing dependency on CRMs by contributing to the development of alternative, viable technologies.

In addition, it is necessary to develop a consistent circular approach incorporating the design of the materials, the design of the product, and the subsequent recycling phase. This will allow for easy replacement of parts, reuse or repair of components, and efficient dismantling and sorting for appropriate recycling.

#### **Reinhilde Veugelers - Senior fellow, Bruegel**

The important objectives of strategic autonomy, decarbonisation, and competitiveness are not always aligned with each other.

In order to deal with this challenge of multidimensionality, the innovation machine and the creation and deployment of new technologies are needed.



Innovation builds on complex knowledge and allows value to be captured from innovation-associated activities on world markets.

# Furthermore, there is a need for policy to drive the innovation machine by incorporating a mix of key instruments such as carbon pricing, regulations, target setting, and subsidies.

In the long term, the innovation machine and innovation capacity are critical in delivering resilience and ensuring reduced dependency and guaranteed autonomy in Europe.

## **Concluding Remarks**

#### Nils Røkke - President, EERA

The endorsement of the timely messages of EERA's key flagship reports on demand reduction and critical raw materials was apparent throughout the respective panel discussions.

Boosting the role of research and innovation is vital for ensuring the attainment of EU targets and reducing the sizable gaps that currently exist in making critical market technologies a reality.

The conversation on demand reduction throughout the conference highlighted an overarching message on the importance of user-centric policies, methods, and systems when it comes to reducing energy demand.

Furthermore, in terms of access to critical raw materials, the current issue of deglobalisation is making it increasingly challenging to provide raw materials for multi-faceted use. This is further rooted in the awareness that trade is the structural pillar of internationally interconnected economies. In this way, the innovation machine can enhance feasibility and reduce the impact of deglobalisation.

On a concluding note, the discussions and thematic pillars of the conference have illustrated that achieving the net-zero goals of the EU will not be possible without the crucial contribution of research and innovation.





Panel Discussion 2: Securing critical raw materials - R&l's role in advancing EU's strategic autonomy and the clean energy transition

