

Nuclear Cogeneration: A potential game-changer to support the European Energy Union

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Outline

- Juncker Priorities
- The Energy Union
- Who will benefit and how?
- What will change?
- Concrete benefits from Nuclear Cogeneration

Juncker Priorities



1. A new boost for jobs, growth and investment
2. A connected digital single market
3. A resilient Energy Union with a forward-looking climate change policy
4. A deeper and fairer internal market with a strengthened industrial base
5. A deeper and fairer Economic and Monetary Union (EMU)
6. A reasonable and balanced free trade agreement with the United States
7. An area of Justice and Fundamental Rights based on mutual trust
8. Towards a new policy on migration
9. Europe as a stronger global actor
10. A Union of democratic change.

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Towards an

Energy Union



1. ENERGY THAT IS SECURE FOR ALL CITIZENS

🔋 TODAY:

The EU is the largest energy importer in the world, costing **€400 billion/year**, or more than **€1 billion/day**.

Over **10%** of the **EUROPEAN POPULATION** cannot pay their energy bills.



🔋 WITH THE ENERGY UNION:

SECURE ENERGY in every member state, to every citizen. Based on **SOLIDARITY AND TRUST**.

Speaking with **ONE VOICE GLOBALLY**.



2. ENERGY THAT FLOWS FREELY ACROSS BORDERS

TODAY:

Markets are largely national. This means **LESS CHOICE, LESS RESILIENCE, HIGHER PRICES.**



Some EU countries are **ENERGY ISLANDS.**
ENERGY INFRASTRUCTURE is AGEING.



WITH THE ENERGY UNION:

Fully **INTEGRATED MARKETS.**



BETTER DEAL for consumers.

3. ENERGY-EFFICIENT PRODUCTS, TECHNOLOGIES, JOBS AND SKILLS OF TOMORROW

TODAY:

90% of housing stock is **ENERGY INEFFICIENT.** **94%** of transport relies on oil.



WITH THE ENERGY UNION:

STRONG, COMPETITIVE COMPANIES across Europe deliver the energy efficient products, technologies, jobs and skills of tomorrow.



ENERGY EFFICIENCY IMPROVED by at least **27%** by 2030.

4. AN ECONOMY THAT IS CLEAN, LOW CARBON AND ENVIRONMENTALLY FRIENDLY

TODAY:

CLIMATE CHANGE leads to severe, pervasive and irreversible impacts for the world.

Urgent need to limit the rise in global average temperature to below **2°C**.



WITH THE ENERGY UNION:

RENEWABLE ENERGY boosted, representing at least **27%** of the energy consumed in the EU by 2030.

Greenhouse gases cut by at least **40%** by 2030.



5. NEW TECHNOLOGY FOR TOMORROW'S ENERGY

TODAY:

The EU has **LOST GROUND** on clean, **LOW-CARBON TECHNOLOGIES**.



WITH THE ENERGY UNION:

LOWER BILLS for EU citizens.

EUROPEAN COMPANIES to be world leading on renewable and low-carbon technologies.



Schedule

25 February 2015:
Commission issues Energy Union Strategy

Later in 2015:

- Communication on the EU position for the climate negotiations
- Communication on how to bring its electricity interconnection level to 10 % by 2020.



Other initiatives in 2015, 2016 and 2017

March 2015: European Council meeting discussed strategy (Atomic Questions Working Group 11.3.2015)

Nuclear mentioned

6 times:

- The EU is highly dependent on the import of **nuclear** fuel and related services to Member States where **nuclear** energy is part of the energy mix. Diversification of supply is important to ensure security of supply. The Commission will update and enhance the requirements on the information to be provided, in accordance with Article 41 of the Euratom Treaty, on **nuclear** installation projects.
- Equally, putting the EU at the forefront of smart grid and smart home technology, clean transport, as well as clean fossil fuel and the world's safest **nuclear** generation, is central to the aim of turning the Energy Union into a motor for growth, jobs and competitiveness.
- **Nuclear** energy presently produces nearly 30% of the EU's electricity. The EU must ensure that Member States use the highest standards of safety, security, waste management and non-proliferation. The EU should also ensure that it maintains technological leadership in the **nuclear** domain, including through ITER, so as not to increase energy and technology dependence.

AQWG of 11.3.2015

DG ENER: overview of Energy Union communication

Euratom already covers most of the communication, in particular:

- Energy security, solidarity and trust (by the European supply agency, and the provisions of the communication on energy security strategy)
 - Decarbonised economy
(nuclear electricity = 53% of EU low carbon electricity)
 - Research, Innovation and Competitiveness
(EU should keep nuclear technology leadership)
-
- ❑ 9 Member States (UK, FR, HU, SK, CZ, LT, BG, RO and PL) would have appreciated if the communication had better recognized the key role of nuclear energy in energy security and decarbonisation.
 - ❑ AT requested that the Energy Union should not be used to promote nuclear energy. FR strongly objected.
 - ❑ SE will not support anything that could favor investments in nuclear technologies.

➔ **No unanimity in sight with respect to current and future role of nuclear in the European energy landscape**

Concrete Benefits from Nuclear Cogeneration

For countries favorable to nuclear:

- **Safety:** HTR/HTGR can be built with extremely attractive safety features
- **Performance:** NC boosts efficiency
- **Timeliness:** Technologically easily accessible non-electric market 90 GWth (steam < 600°C)

Concrete Benefits from Nuclear Cogeneration

- **Environment:**
 - CO₂ savings (and other GHG and pollutants):
600 MWth saves:
 - 1 Mt/yr CO₂ if replacing natural gas
 - 1.8 Mt/yr CO₂ if replacing coal
 - Because the consumption is so high, any CO₂ curbing strategy can only be effective if addressing also industrial process heat.
- **Cost:** x €/t CO₂ saved; cost stability
- **Energy Security:**
Gas is better used as feedstock;
Diversification of energy supply

Concrete Benefits from Nuclear Cogeneration

- **Interoperability:**
 - System Integration Options with variable renewables
 - Load following, energy storage, poly-generation
- **Re-industrialization:**
 - halt "carbon leakage"
 - maintain strategically important bulk industries in EU; increase industry part of GDP from 16% to 20% by 2020
 - keep European energy-intensive and nuclear industries competitive and at top notch level
- **Economy (based on current numbers):**
 - Jobs: approx. 1205 direct jobs/GWth
 - GDP: approx. 168 M€/yr/GWth



Conclusion

- Any effective CO₂ curbing strategy must address industrial process heat.
- Nuclear Cogeneration is a large, long-term, strategic infrastructure investment.
- It has large potential impact to make the Energy Union successful.

Back-ups

Energy Union

Why must the EU act?

- **Biggest energy importer** in the world
53% at around € 400 bn/year
- **Incomplete internal energy market**,
some parts of the EU remain isolated **energy islands**.
- **Renewable energy not fully integrated into the electricity system.**

Objective:

- Significantly reduce Europe's reliance on fossil fuels...
- ...by removing barriers to the flow of energy...
- ...in a fully integrated EU-wide energy system

Who will benefit and how?

European citizens:

- **Limit energy bills** using smart technology
- **Generate own energy** from renewable sources and feed this into the electricity grid
- Better energy security will **reduce the risk of black-outs**.

Businesses:

- **New energy and climate technologies and services**
- **Green growth and jobs** in the EU and **export opportunities** abroad
- **More certainty** for investors, with price signals reflecting long-term needs and clear policy objectives.

Climate:

- An ambitious **reduction of at least 40 % in CO₂ emissions** by 2030
- **More renewable energy** in the EU's energy mix
- **Energy efficiency** will be **increased**, especially in the building and transport sectors.

What will change?

The Commission proposes

- doing more to ensure that Member States **implement and enforce** existing legislation
- passing legislation to **increase gas and electricity supply security** and other measures to **reduce Europe's reliance on dominant suppliers**
- setting up an Energy Infrastructure Forum to **make sure major infrastructure projects** are **delivered** where and when needed
- passing legislation to **modernise the European energy market** and **reinforce the regulatory framework** at regional and European level
- passing legislation to ensure the **2030 climate and energy targets** are reached
- making **energy costs and prices** more transparent
- making **buildings more energy-efficient** and **decarbonising** the **transport** sector
- putting an initiative on global **energy and climate technology and innovation** leadership in place