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Europe is facing a tremendous challenge for electricity generation in the 2 or 3 decades to come

- We are facing **a huge boom of electrification** in the years to come in all sectors, buildings, industry, transportation, hydrogen → the additional TWh we need to generate are in the order of magnitude of **1000 additional TWh between 2020 and 2050**.
 - Need to turn most of the **current** electricity generation into a **very low carbon one** . It means, **existing 900 TWh electricity generation** has to be turned into very low carbon one between today and 2050
 - **2000 TWh new very low carbon** generation to be connected to the grid in 30 years to come : **a HUGE figure**
- ➡ **All technologies are required : it re-opens the door for new nuclear generation together with increased needs for renewables in the EU.**

Nuclear is not an old-fashioned business nor a transitional energy source. It is an industrial solution

- Advantages of nuclear energy are
 - **Low carbon generation** : French nuclear fleet emission from birth to grave are **4g/ kwh**
 - **Very small footprint**: EDF plans to build two additional EPR2 reactors on the Penly which already host two 1.3 GW existing ones. The total surface of the site is 230 ha for 40 TWh of electricity per year or **200 000 Mwh per ha**. A photovoltaic plant generate **2000 Mwh per ha** in a sunny region, one hundred time less
 - **Nuclear generation costs are very stable** because the cost of operating the plant is a small part of the Leverage Cost of Electricity, around 25%
- Regarding the key drawbacks of nuclear:
 - **The EU has included certain type of nuclear installations in the Taxonomy regulation (july 2022)**
 - JRC report key findings about taxonomy : (I) we need to have a **strong regulatory framework** in order to enforce a high level of safety for construction and operation of the plants by the nuclear operators (ii) **disposal of long-lived waste in deep geologic formation**
 - On cost and delays, the **key driver for success is the serie effect**

 **Success can be reached on the basis of a serie of identical reactors only.**

Small Modular Reactors bring additional advantages in this global promising landscape

- European Commission launched **European pre-partnership on SMR** in June 2022 → Nov 2023 opens **perspective of turning this pre-partnership into an European Alliance**.
- **SMR using light water reactor technology could be available on the market by the beginning of next decade** as they are based on a well experienced back ground : more affordable and so less risky than big units as their size is up to 10 times smaller.
- **Advanced Modular Reactor or AMR are also on stage**. Four main technologies . They are going to come later on the market. Wastes reduction and fuel recycling is made possible. **High temperature heat for the industry also**

→ SMR and AMR could be a key tool to reach net zero. These two technologies are **complementary** and they must be pursued in parallel. **They would also be complementary of Renewables** because they play the role of an enabler of renewables development for grid stability.

Several countries are speeding up the nuclear road in Europe

- Fourteen Members States (+UK and Italy as observer) have asserted their commitment to the **pursued strengthening of European cooperation** in the field of nuclear energy as an important component of Europe's energy and climate ambition
- At the EU Parliament level, the framework of measures for strengthening Europe's net-zero technology products manufacturing ecosystem (called Net Zero Industry Act) as adopted on November 21st 2023, **in it's actual status**, has recognized **the nuclear fission as a strategic industrial technology** which should be supported at the same level as any other low carbon energy production process.

Should you decide, Italy has a lot of assets to enter this playing field

- Nuclear development need **partnerships, supply chain and competences**. Italy has all of them.
- **Italians companies, research centers and universities are partnering with the European research and development nuclear community** : SNETP platform, projects financed by the EURATOM treaty, PoliMi has never trained as many Phd as today.
- As for the Italian industrial relation with France several agreements have been signed over the last 18 months; **Italy has also a strong industrial nuclear supply chain** : a key asset for development of new reactors.
- EDF nuclear fleet suffered in 2022 a severe drawback. For repairing our plants we needed stainless steel pipes in big quantities → **Tectubi and IBF companies supplied more than 1 km of straight pipes of 10 and 12 inches diameter and more than 1000 elbows.**
- **As EDF CTO let me thank the Italian industry for your help in that respect**

➔ **Nuclear Industry is already present in Italy. We need Italy for the development of Nuclear in Europe**



Thank You

