



framato**me**

2024 LAS/ANS Symposium

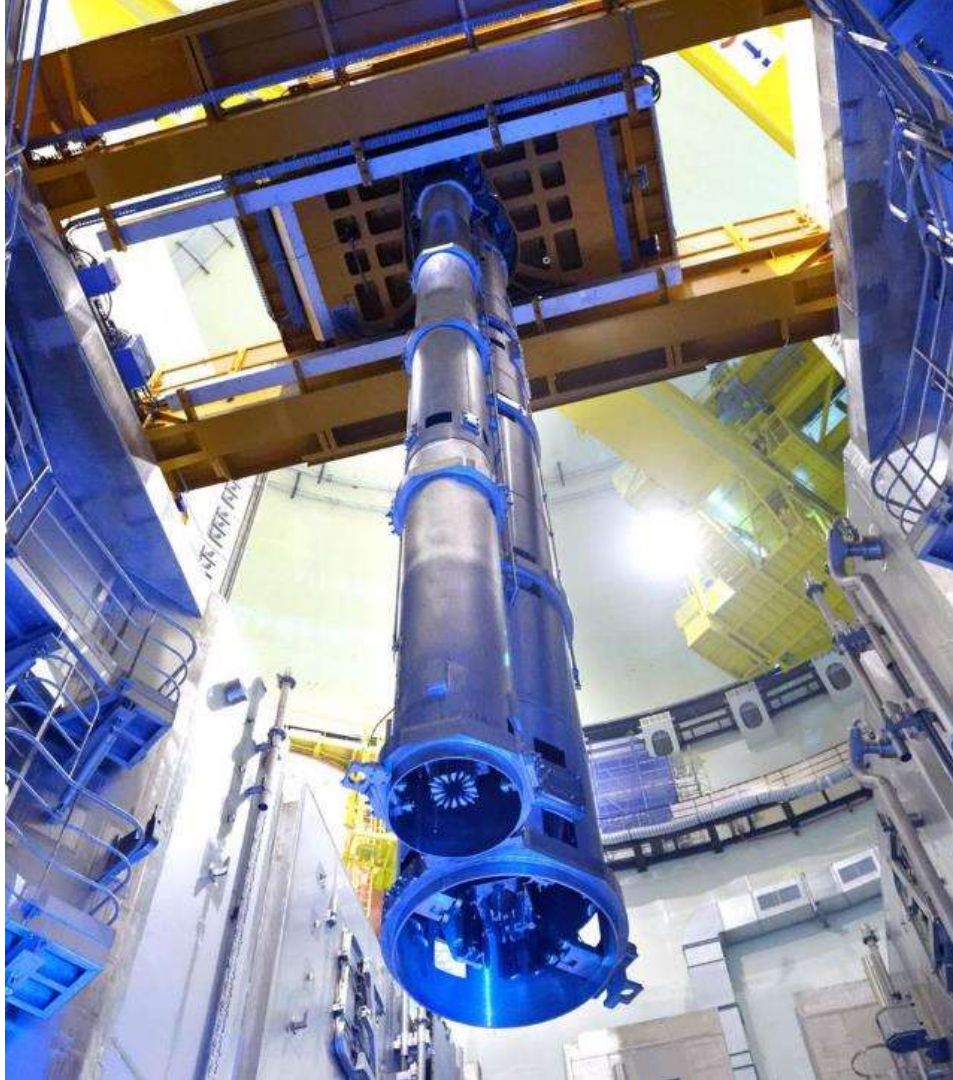
Regional Cooperation for the Energy
Transition: The Role of Nuclear Power
Under the Environmental and
Technological Constraints

Raphaela Oliveira

Engineering

Rio de Janeiro

July/2024



Framatome at a glance

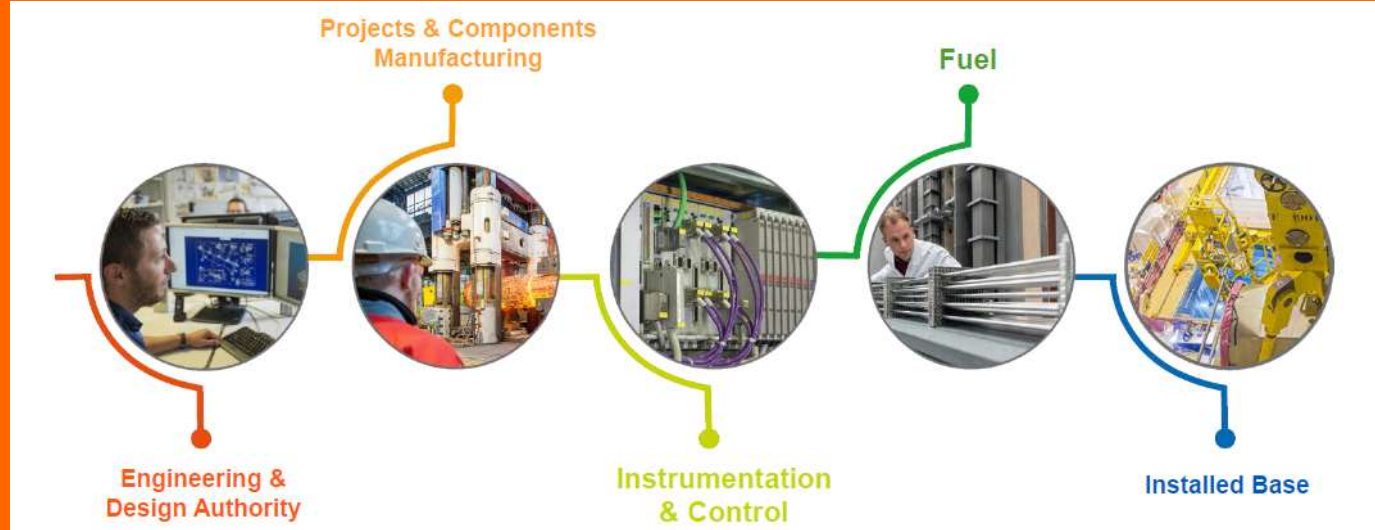
For over 60 years, Framatome's teams have been involved in developing safe, competitive, clean, low-carbon nuclear energy worldwide.

The original equipment manufacturer of **84** nuclear power plants in operation.



framatorne

Our Activities in a nutshell



Our values

Safety

Passion

Performance

Future

Integrity

Our Activities in a nutshell

Espacial



Transformação digital



Segurança Cibernética



Medicina



Hidrogênio



Worldwide presence

França

- Beaumont
- Chalon-sur-Saône
- Cherbourg
- Frans
- Grenoble
- Jarrie
- Jassus-Riot
- Jeumont
- Le Creusot
- Les Achards
- Lyon
- Marseille
- Massy
- Maubeuge
- Montbard
- Montreuil-Juigné
- Orsan
- Paimboeuf
- Paris
- Romans-sur-Isère
- Rugles
- Rungis
- Saint-Marcel
- Saint-Paul-lez-Durance
- Sully-sur-Loire
- Ugine

EUA

- Benecia
- Charlotte
- Christiansburg
- Cranberry Township
- Jacksonville Houston
- Lynchburg
- Mansfield
- Richland

Resto do Mundo

- Belgium: *Brussels*
- Brazil: *Rio de Janeiro, Angra dos Reis*
- Bulgaria: *Sofia, Kozloduy*
- Canada: *Pickering, Kincardine, Montreal*
- Czech Republic: *Prague, Dukovany*
- Finland: *Olkiluoto*
- Hungary: *Budapest, Paks*
- Japan: *Tokyo*
- Romania: *Bucarest*
- Russia: *Moscow*
- Slovakia: *Bratislava*
- South Africa: *Cape Town*
- South Korea: *Seoul, Daejeon*
- Spain: *Zaragoza, Tarragona, Madrid*
- Sweden: *Helsingborg*
- Switzerland: *Leibstadt*
- Ukraine: *Kiev*
- United Arab Emirates
- United Kingdom: *Bristol, Cranfield*

Alemanha

- Erlangen
- Karlstein
- Lingen

China

- Beijing
- Daya Bay
- Deyang
- Haiyan
- Lianyungang
- Shanghai
- Shenzhen
- Taishan



+ 18,000
colaboradores

+ 70 sites

+ 20 países

Our worldwide presence



Okiluoto 3 - **Finlândia**



Angra 2 - **Brasil**



Taishan - **China**



Hinkley Point C - **Reino Unido**

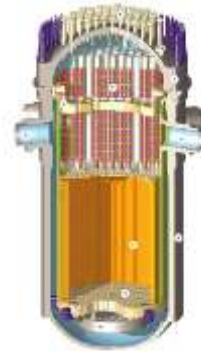


Angra 3 - **Brasil**

Sizewell C - **Reino Unido**



Reactors models



(PWR)

EPR EDF / Framatome



380 reactors served
worldwide

Angra II e Angra III (PWR)
Siemens Pre-Konvoi



Projection of Angra 3 in operation

Framatome in South America

Framatome in Latin America

- A 40 years presence in South America
 - Engineering and Commercial Office in Rio
 - Operational presence on site: Atucha & Angra
- OEM of Angra 2 & 3, Atucha 1 & 2

Services & Supply of Equipment and Parts

- Support to the construction and commissioning of the NPPs;
- Services expertise for all types of reactors, all along:
 - Angra 1 & 2, Atucha 1&2, Embalse: Specialized engineering, maintenance expertise, outage services

Fuel

- Components supply
- Manufacturing support
- Design of Angra 2's fuel in collaboration with INB and ETN



Atucha I and Atucha II



Angra 1 and Angra II

The World Knows the Way to a Sustainable Climate Solution World

Plan for the Construction of Nuclear Reactors

Proposed: 343

Planned: 92

Under Construction: 61

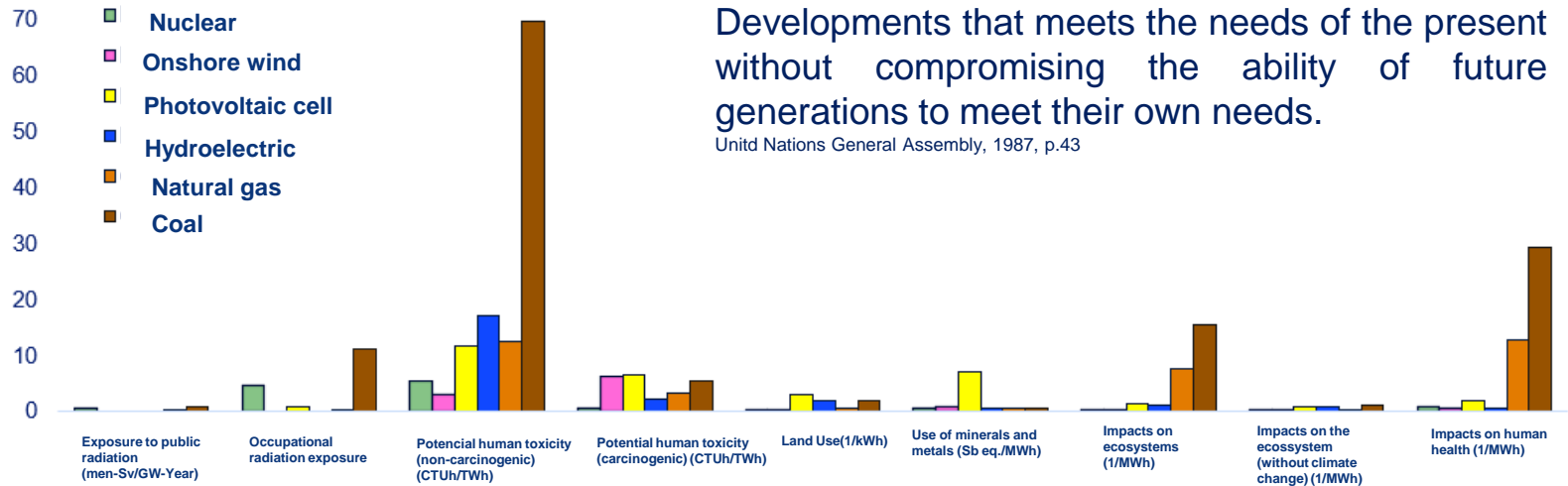


Fontes: IEA, 2023 e WNA, 2023

All Energy Sources cause impacts

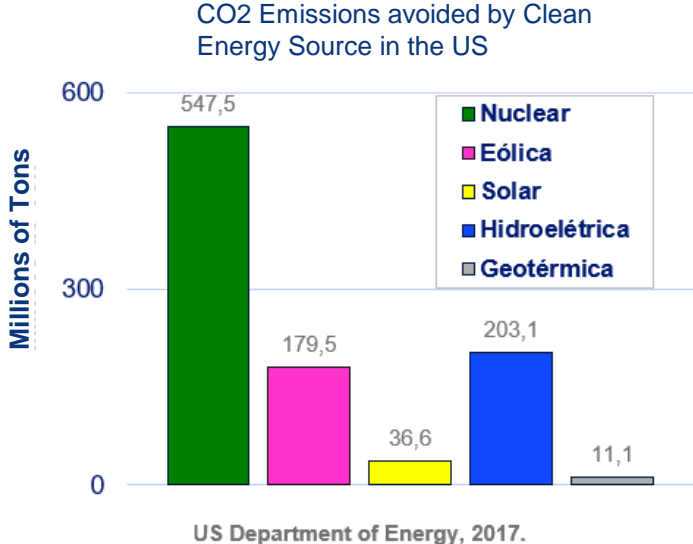
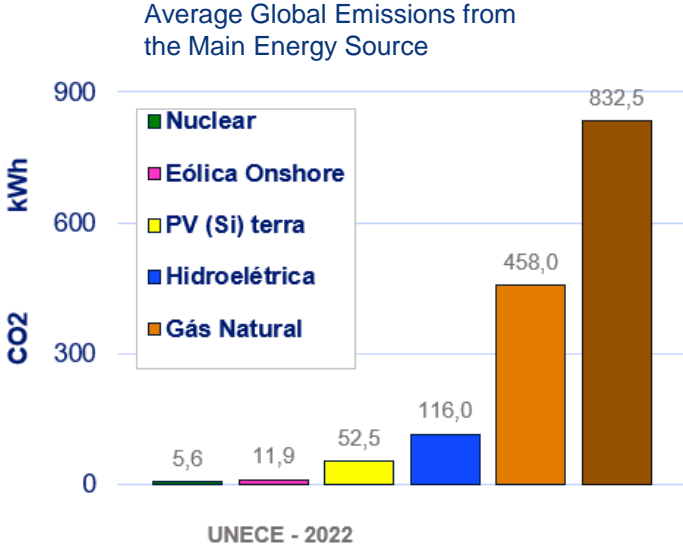
The Main Sources of Energy

Environmental, social and economic impacts of the main energy sources



Fonte: UNECE - 2022

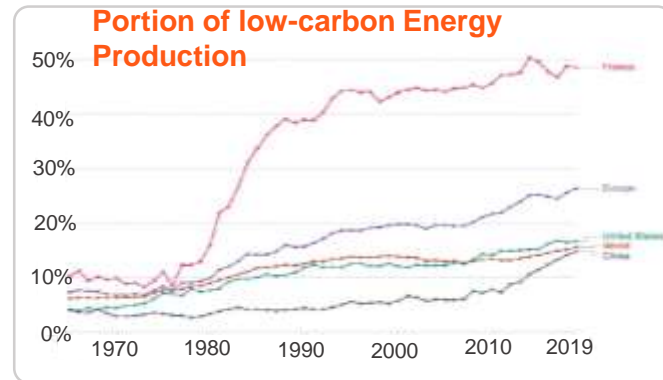
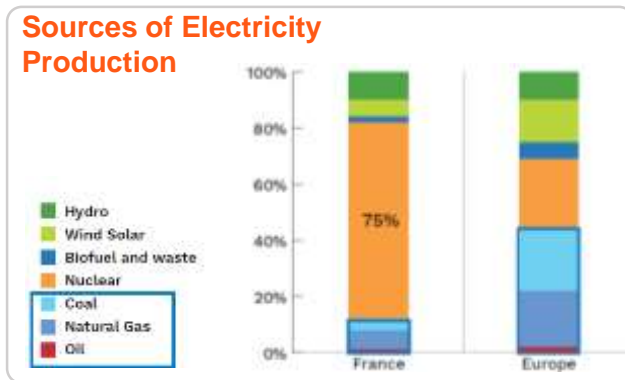
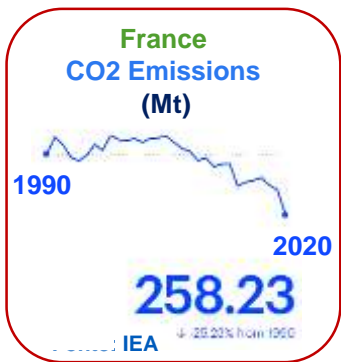
CO2 Emissions



Nuclear

The Key to a Sustainable Climate Solution

France: A successful case



**From 1971 to 2018,
nuclear energy avoided
74 Gt of CO2.**

IEA Global Energy Review 2019.



**Equivalent to 6 years of
emissions from all global
energy production.**

Contributions in Energy: Optimization

Reducing Carbon Footprint for Nuclear Plant

Net-Zero emission boosters

Extensive range of solutions

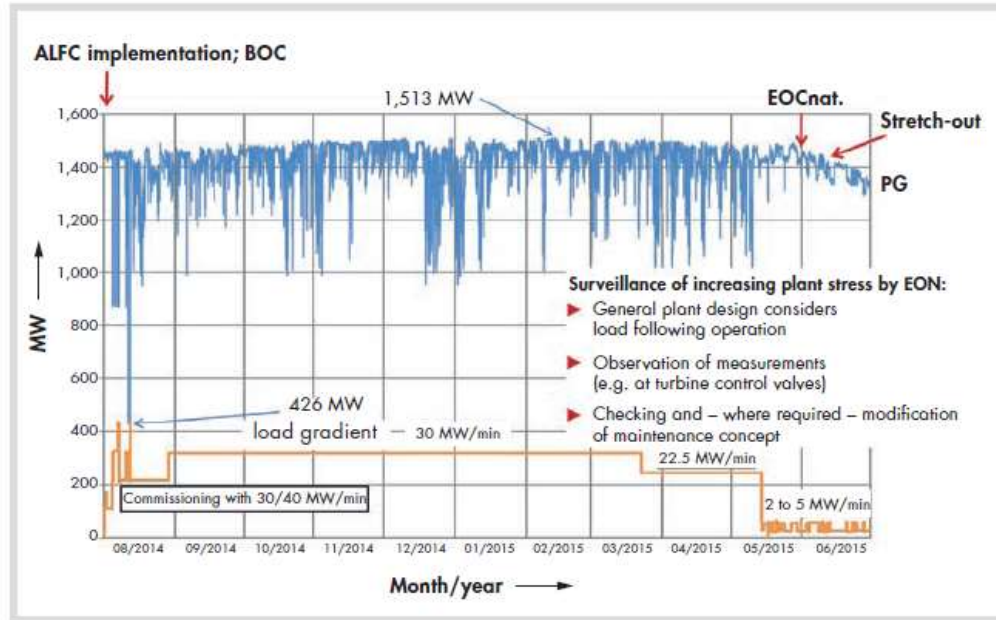
Proven experience

- Operator Assistance Predictive System (OAPS) for flexible operations;
- Carbon footprint and service life optimization solutions;
- Obsolescence management with CO2 reduction solutions; etc.

Solution for further reduce carbon footprint

- Increased delivery of low CO2 electricity from the NPP.
 - Secure power uprates solutions deployed in the plant.
 - Guarantee of additional energy production.
- Framatome adapts to the precise needs of **Net-Zero approach**.

Advanced Load Follow Concepts (ALFC) : fully automated flexible load following reactor control



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Thank you

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