

ORDEM
DOS
ENGENHEIROS

Os Desenvolvimentos da Energia Nuclear e as Consequências Geopolíticas para a União Europeia



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ANO OE
ENERGIA E
CLIMA

CONFERÊNCIA INTERMÉDIA
2023 | ANO OE ENERGIA E CLIMA

**ANÁLISE ESTRATÉGICA
DA ENERGIA NUCLEAR**

28 SET.
ESCOLA SUPERIOR DE TECNOLOGIA
E GESTÃO DE VISEU

SAMUEL FURFARI

ESCP
EUROPE





REUNION DES MINISTRES
DES AFFAIRES ETRANGERES

RESOLUTION
adoptée par les
Ministres des Affaires étrangères
des Etats membres de la C.E.C.A.,
réunis à Messine les 1er et 2 juin 1955

***"There will be no future for the
European Community without
cheap and abundant energy"***

tion européenne. Il
réalisée tout d'abord dans le domaine



Frans Timmermans' team

Frans Timmermans' team supports him in his daily work.

Contact the team

Email frans-timmermans-contact@ec.europa.eu

Address European Commission
Rue de la Loi / Wetstraat 200
1049 Brussels



Didi Samsom nieuwe klimaatlakeni Timmerfrans

PvdA-baantjescarroussel draait vrolijk door in Brussel



Head of Cabinet
Diederik Samson

Email

Phone number

Responsibilities



No mention at all of nuclear energy

Energy efficiency | buildings, Heat pumps

Importing from Ukraine | electricity, H₂

More wind and more solar PV

Hydrogen

More non-Russian gas

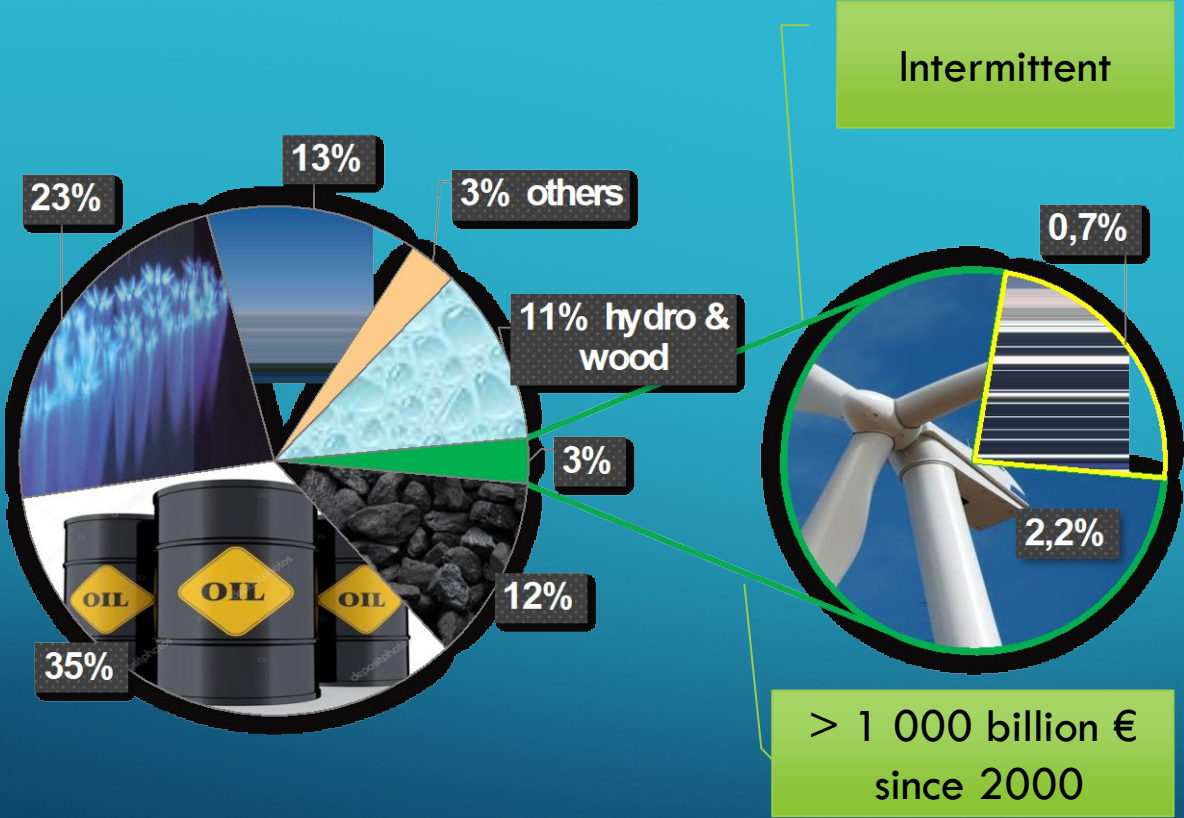
REPower EU May 2022

- €300 billion in financing
 - €72 billion in the form of grants
 - €228 billion in loans



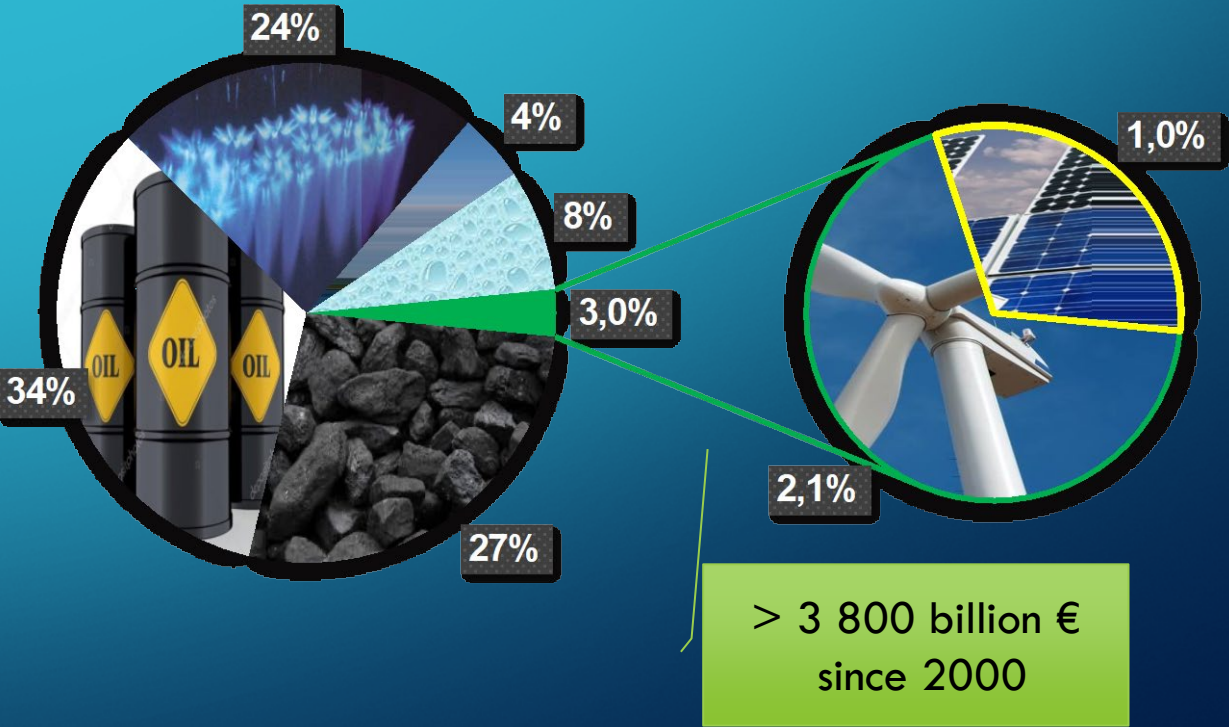
EU and world primary energy consumption

EU



Data: Eurostat, 2021 for 2019

World

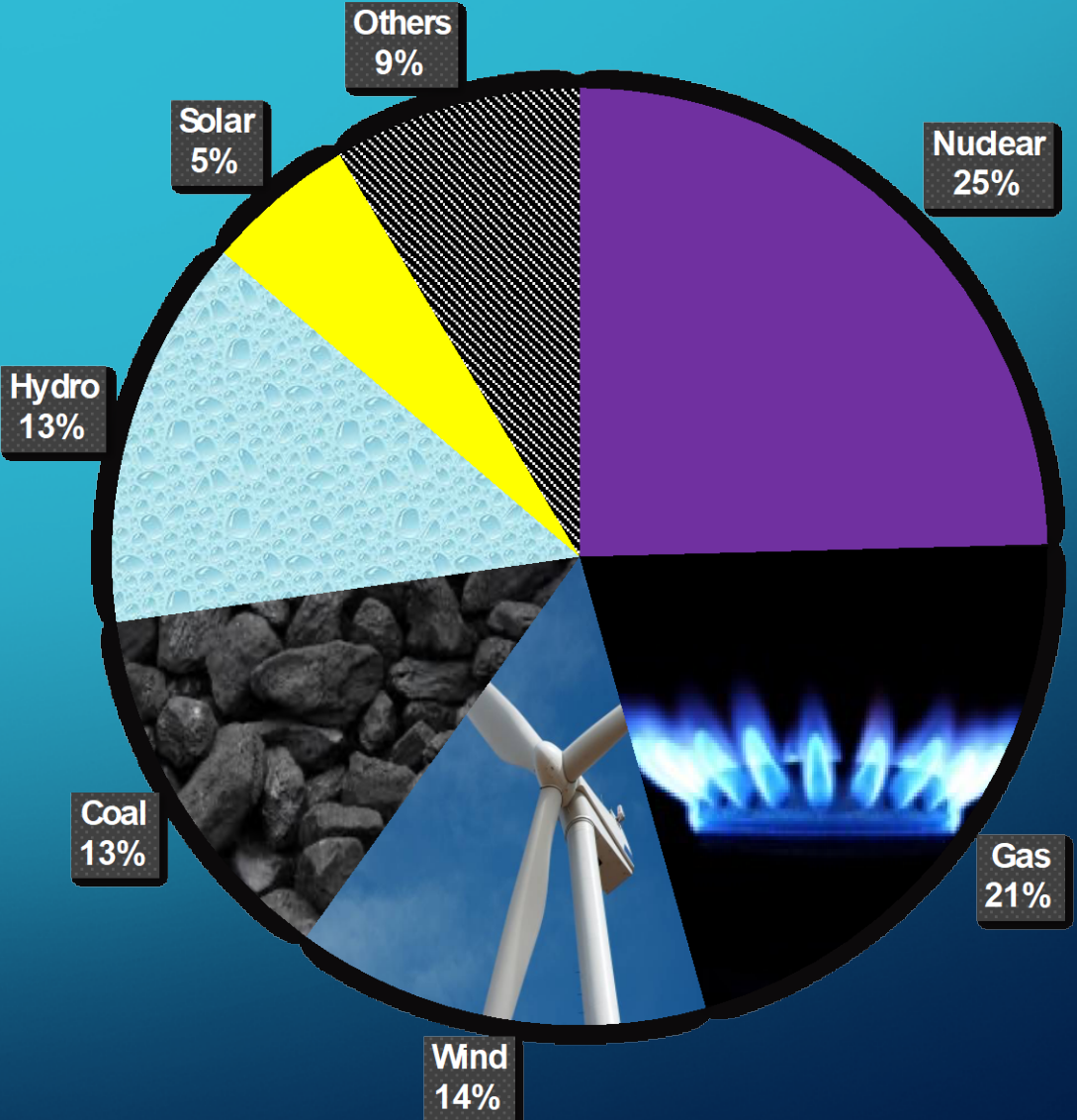


Data: BP, 2022 for 2021

Nuclear, a EU reality



EU-27 elec generation in 2020

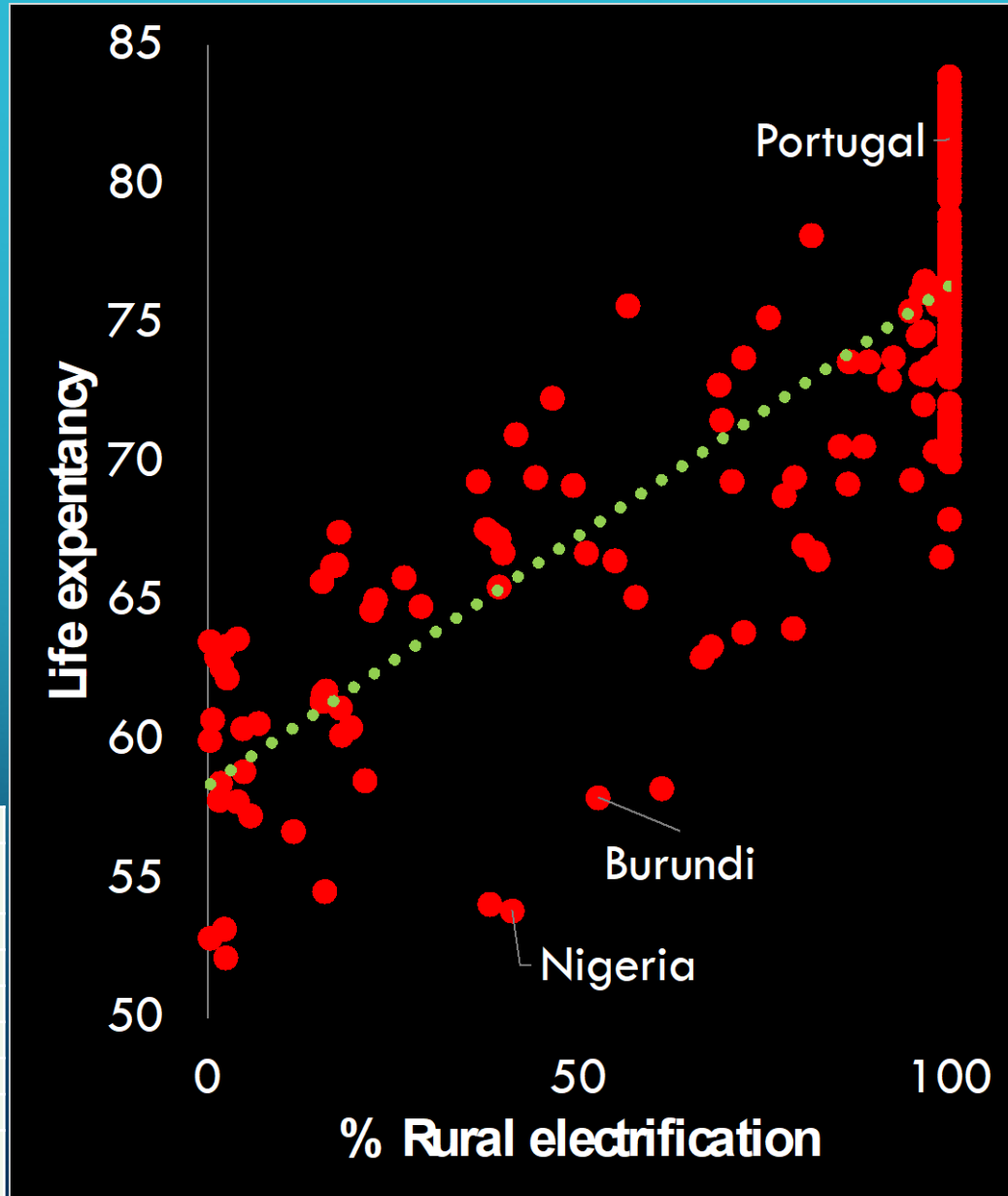


A photograph of a nuclear power plant at night. The scene is dominated by several large, white, hourglass-shaped cooling towers that are illuminated from within, casting a warm glow. The towers are set against a dark blue night sky. In the foreground, the lights from the plant and the towers are reflected in a body of water, creating a shimmering effect. The overall atmosphere is industrial and futuristic.

Why nuclear, is the energy of the future for electricity generation ?

Electricity is life and quality of life

Life expectancy

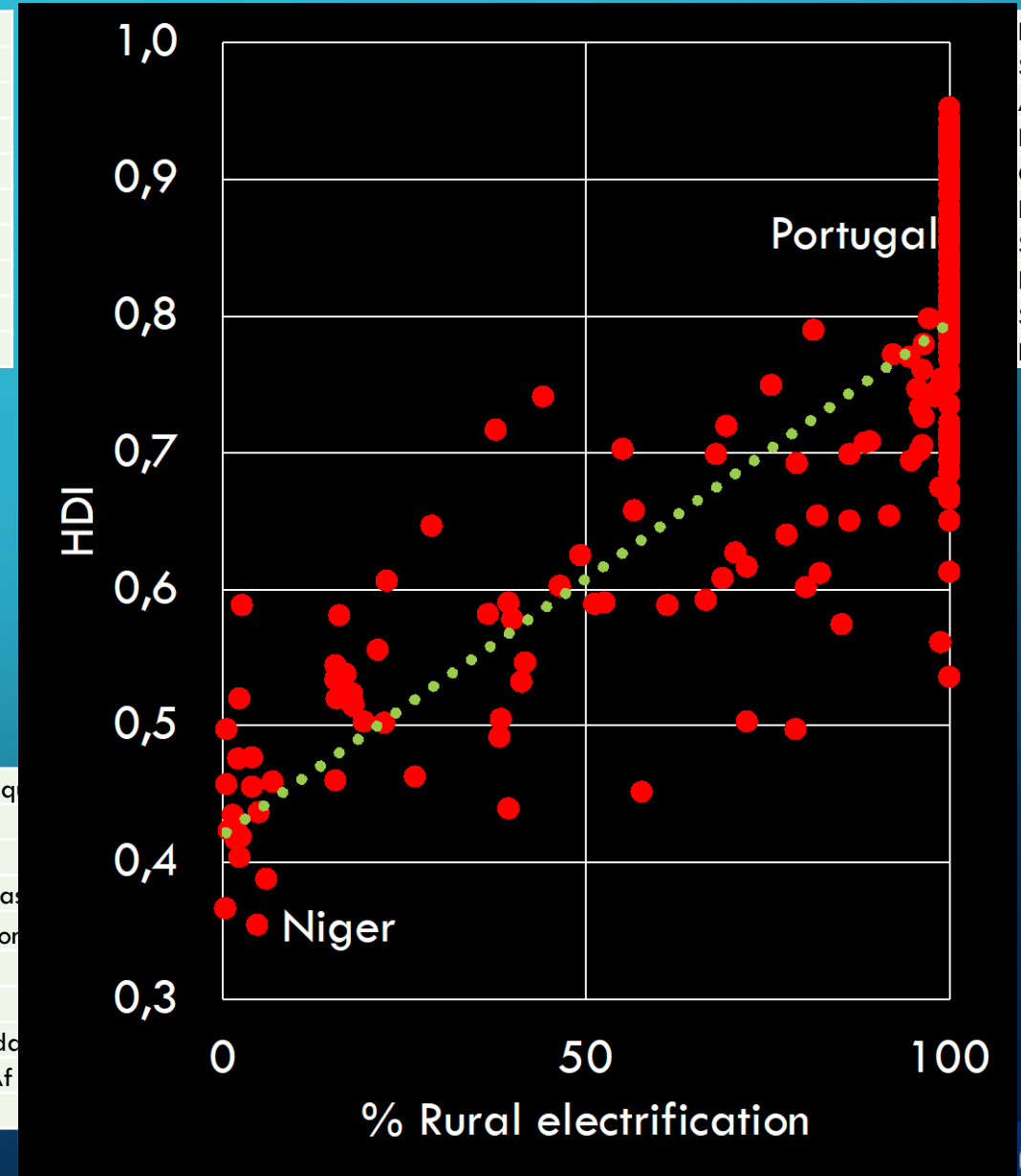


- Burundi
- Guinea-Bissau
- South Sudan
- Somalia
- Lesotho
- Côte d'Ivoire
- Nigeria
- Chad
- Central Af Rep

- Hong Kong
- Japan
- Switzerland
- Spain
- Singapore
- Italy
- Australia
- Iceland
- France
- Israel

- Mozambique
- Liberia
- Mali
- Burkina Faso
- Sierra Leone
- Burundi
- Chad
- South Sudan
- Central Af Rep
- Niger

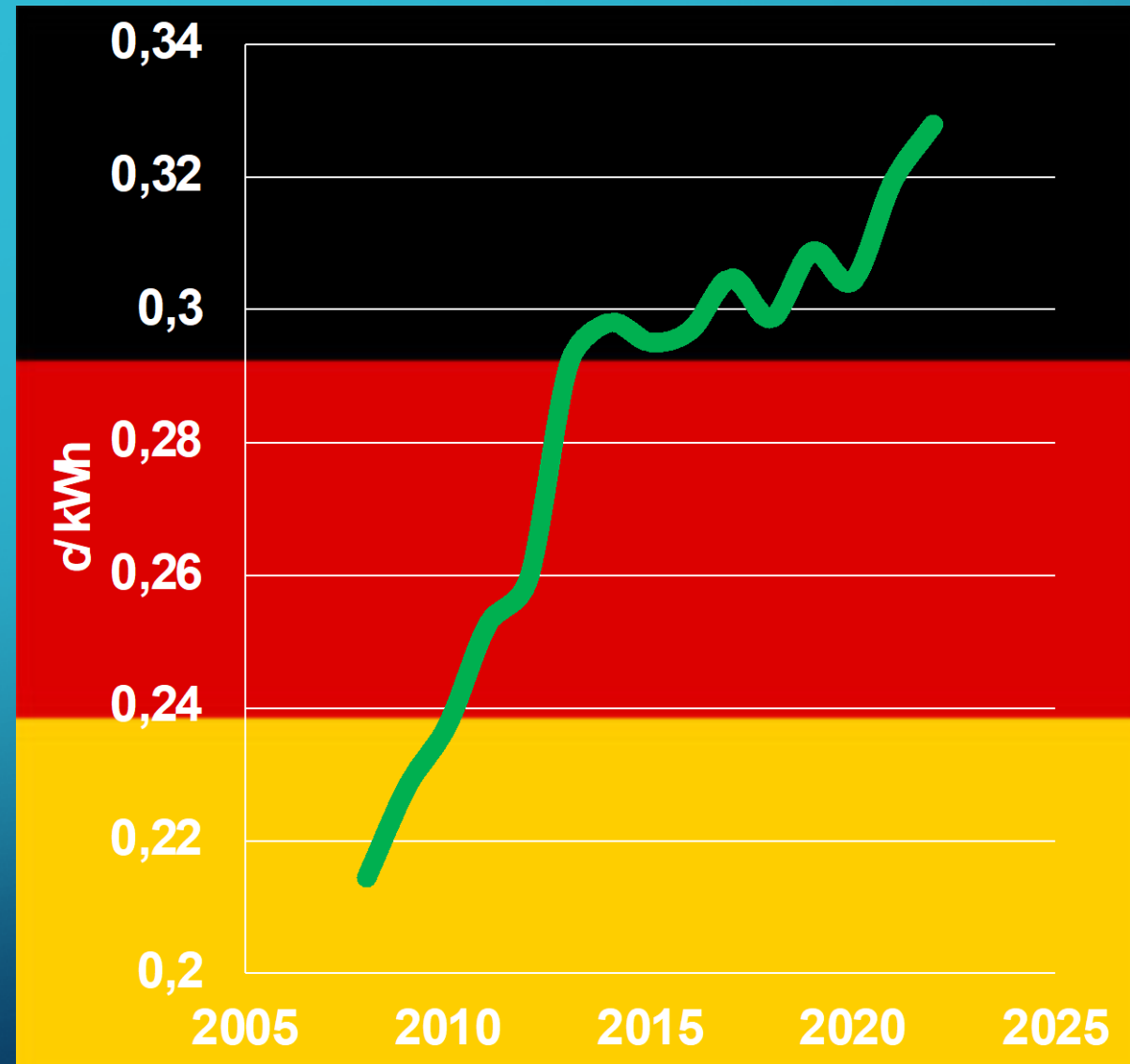
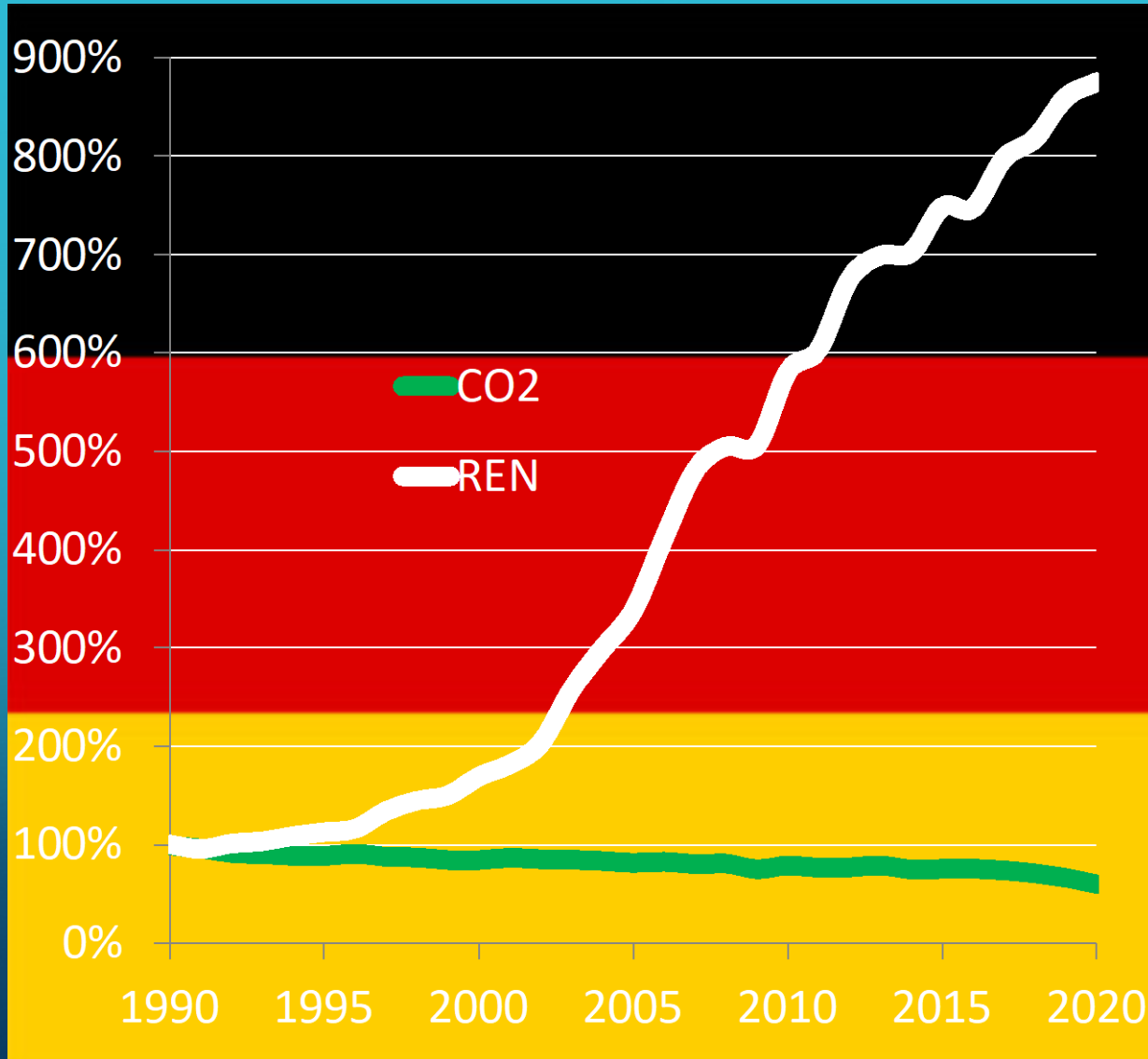
HDI



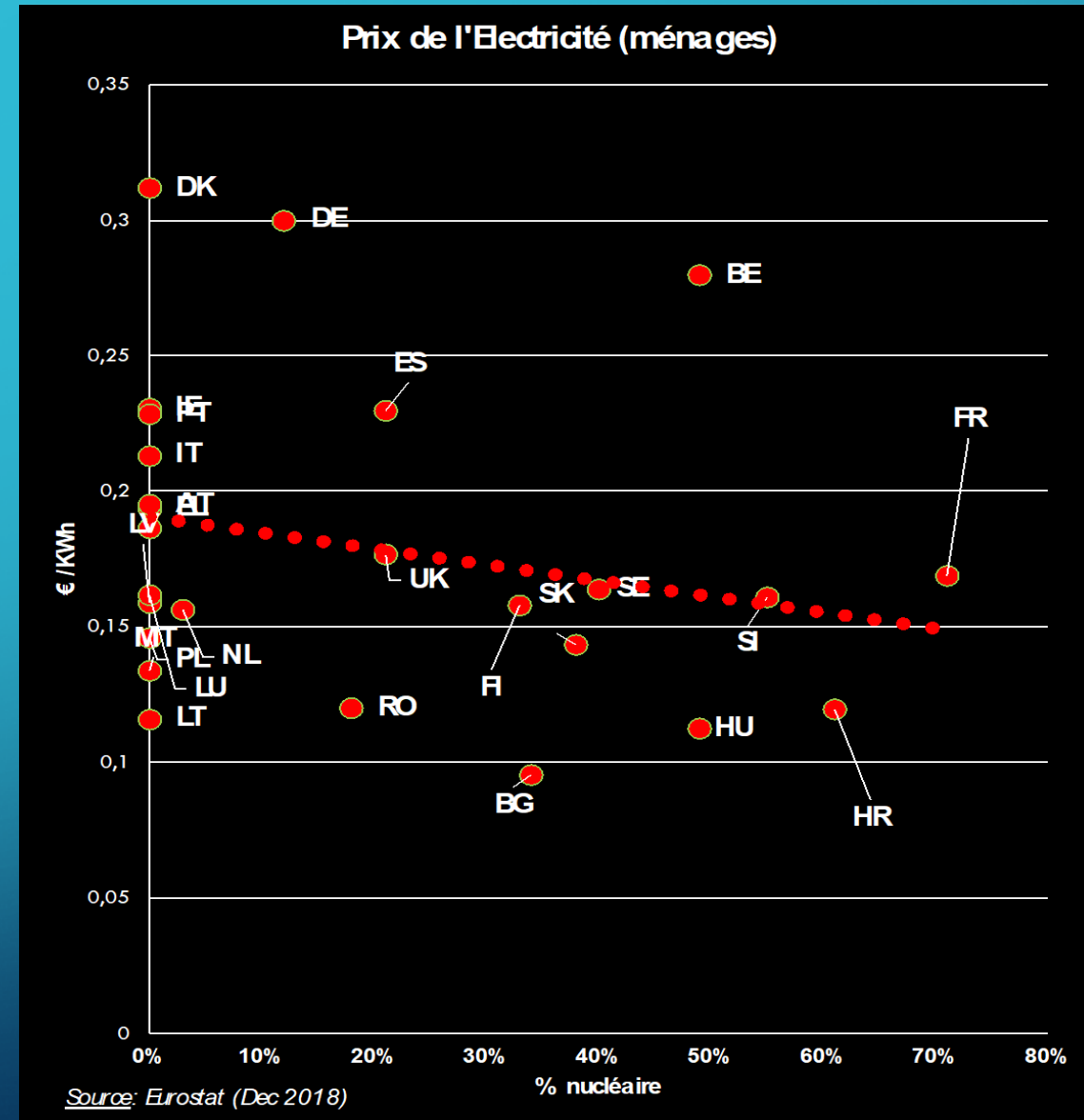
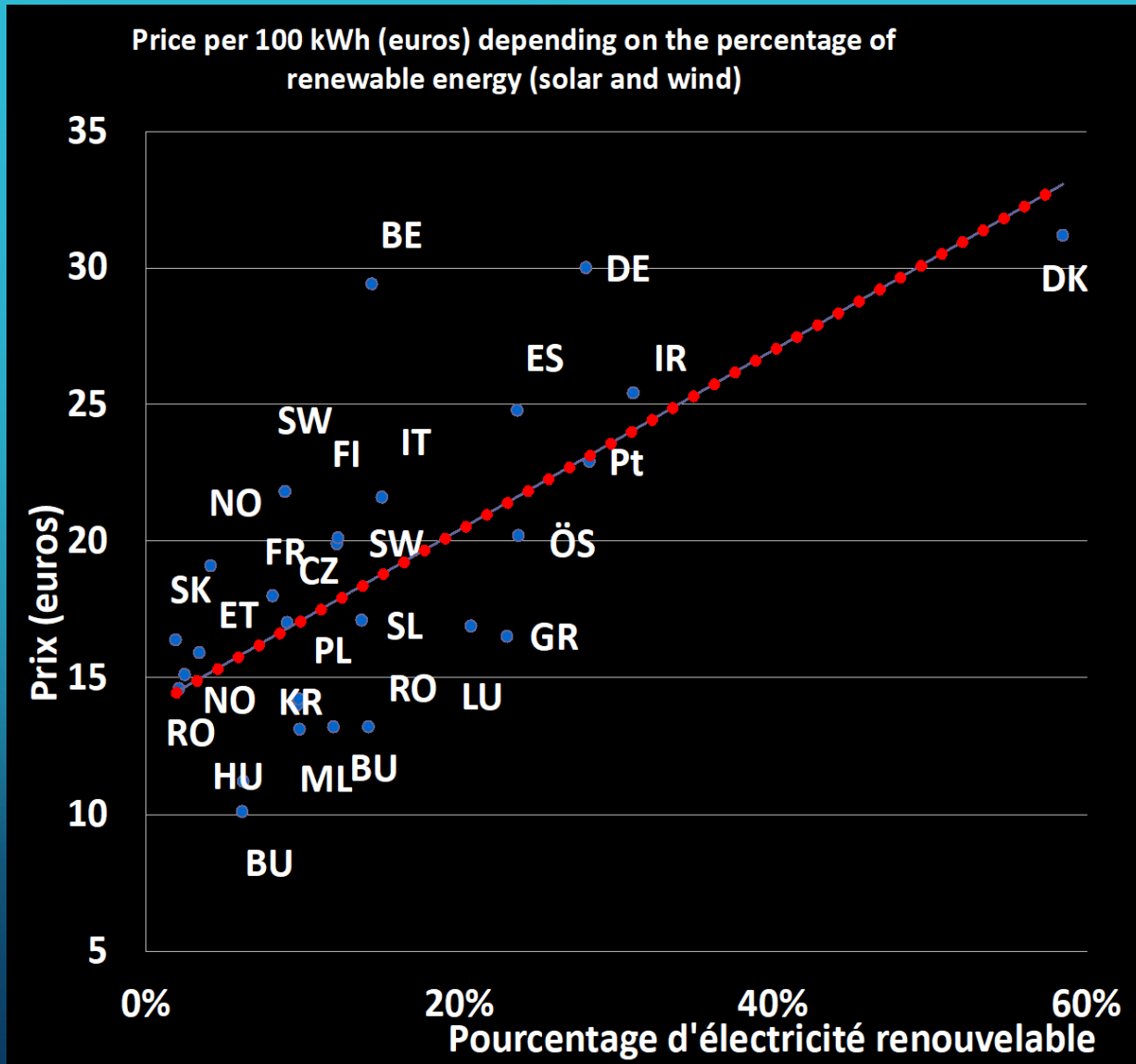
- Norway
- Switzerland
- Australia
- Ireland
- Germany
- Iceland
- Sweden
- Hong Kong
- Singapore
- Netherlands



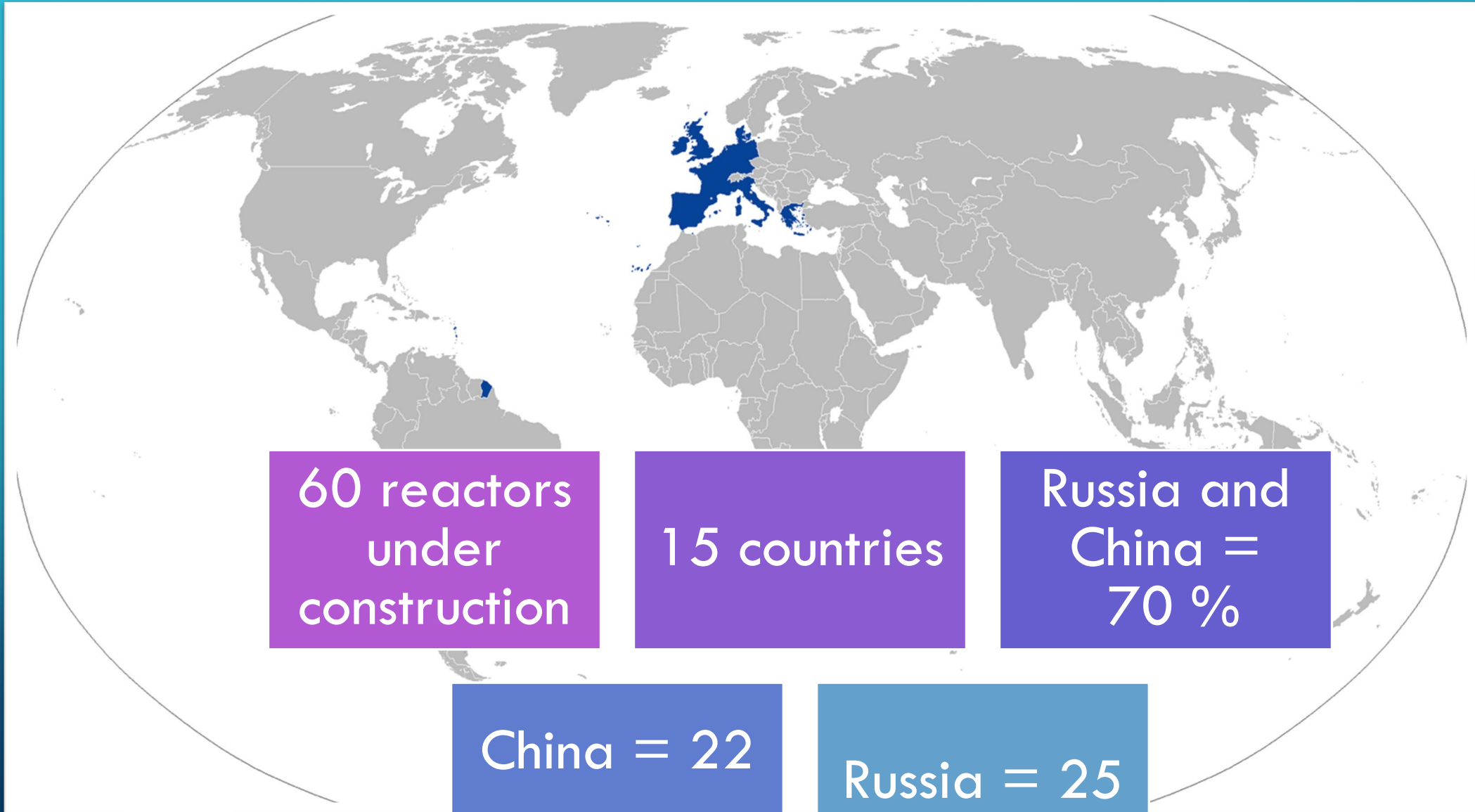
Germany, the right Example?



Is the fuel mix impacting the price for citizens?



Nuclear power: a strong reality around the world



60 reactors
under
construction

15 countries


Russia and
China =
70 %

China = 22


Russia = 25

Rosatom NPPs projects in the world




 Belarus, Ostrovets NPP, VVER-1200



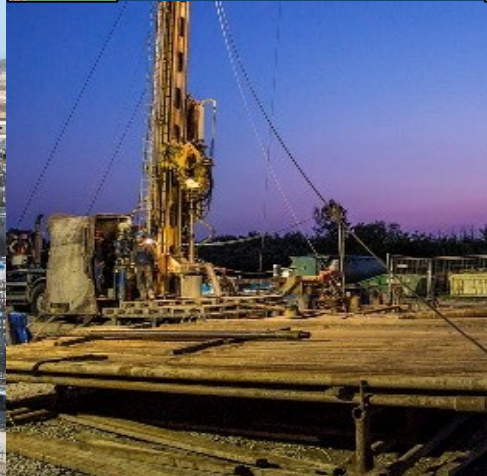
 Bangladesh, Rooppur NPP, VVER-1200




 Turkey, Akkuyu NPP, VVER-1200




 India, Kudankulam NPP, VVER-1000




 Hungary, Paks II NPP, VVER-1200




 Finland, Hanhikivi-1 NPP, VVER-1200



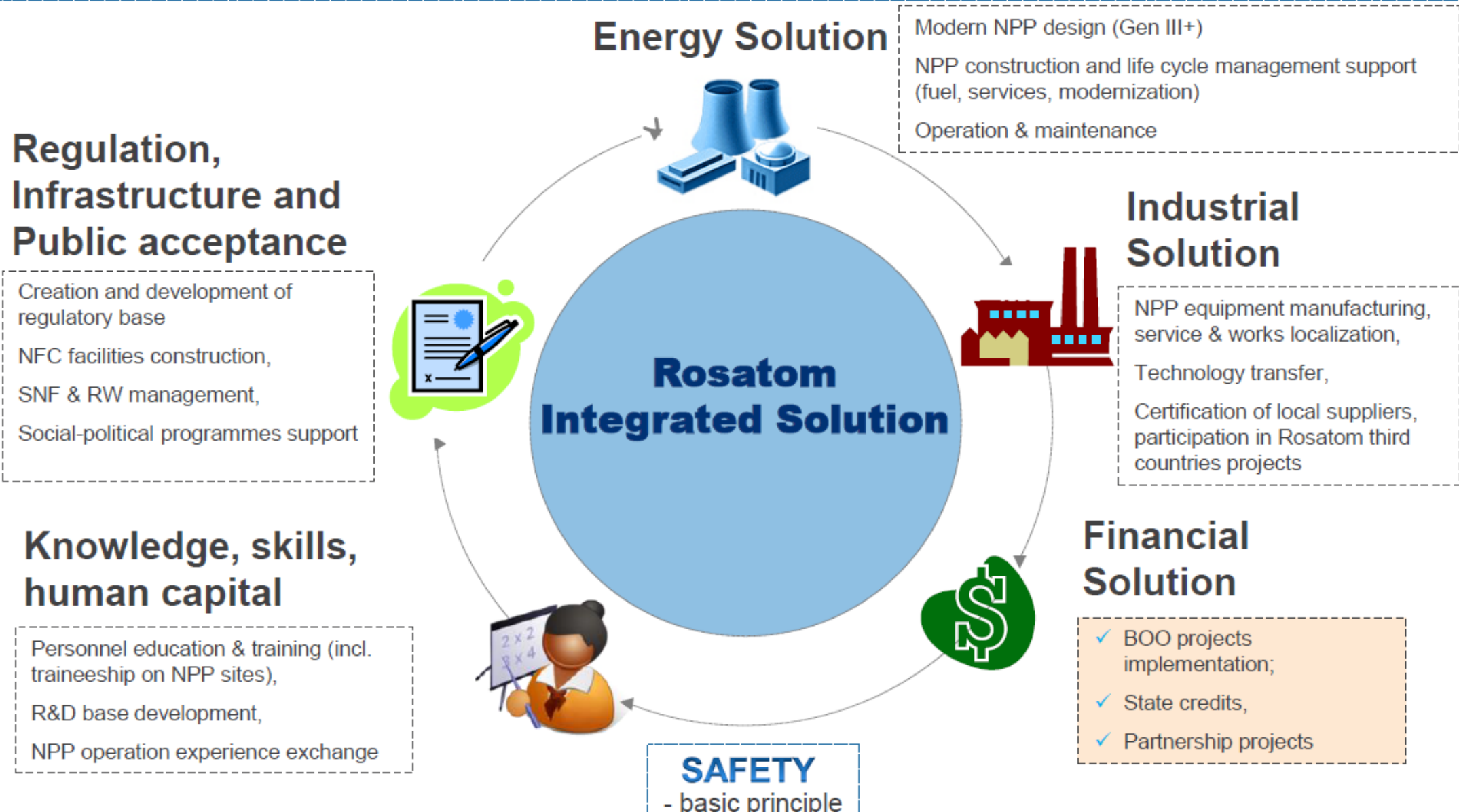
 Egypt, El-Dabaa NPP, VVER-1200



 China, Tianwan NPP, VVER-1200



Rosatom Integrated Solution



Next Nuclear PP are prepared today...by Rosatom

54

RR located in Russia

22

RR constructed abroad

Scientific purposes

e.g. to study material, for production of medical isotope, for education of students, or training, etc



Morocco is going nuclear



by **Pallak Kashyap** —

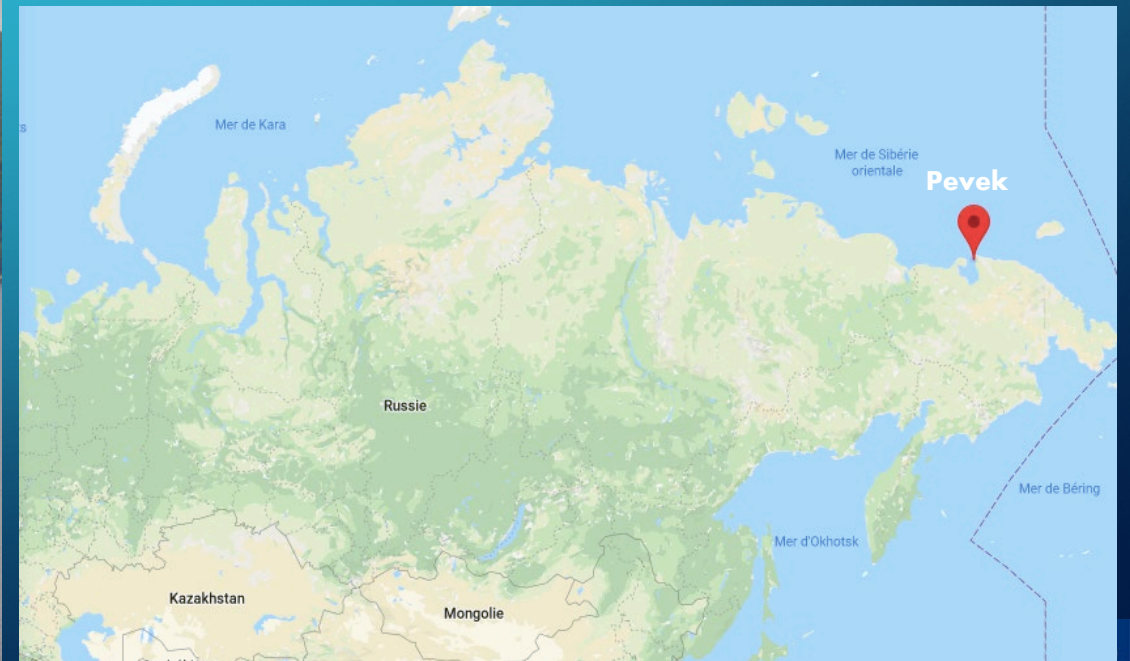
October 15, 2022 in [Africa](#), [Geopolitics](#), [Global Issues](#) Reading Time: 3 mins read



(Source: Morocco World News)



From submarines to markets



Floating nuclear power plants for mining in Chukotka

by Dr. Michael Wenger | Jul 27, 2021 | Archive, Economy, Energy, Industry



XAVIER MOREAU REÇOIT ALEXEÏ TCHÉKOUNKOV, MINISTRE RUSSE DE L'EXTRÊME
-ORIENT ET DE L'ARCTIQUE, EN MARGE DU FORUM ÉCONOMIQUE ORIENTAL

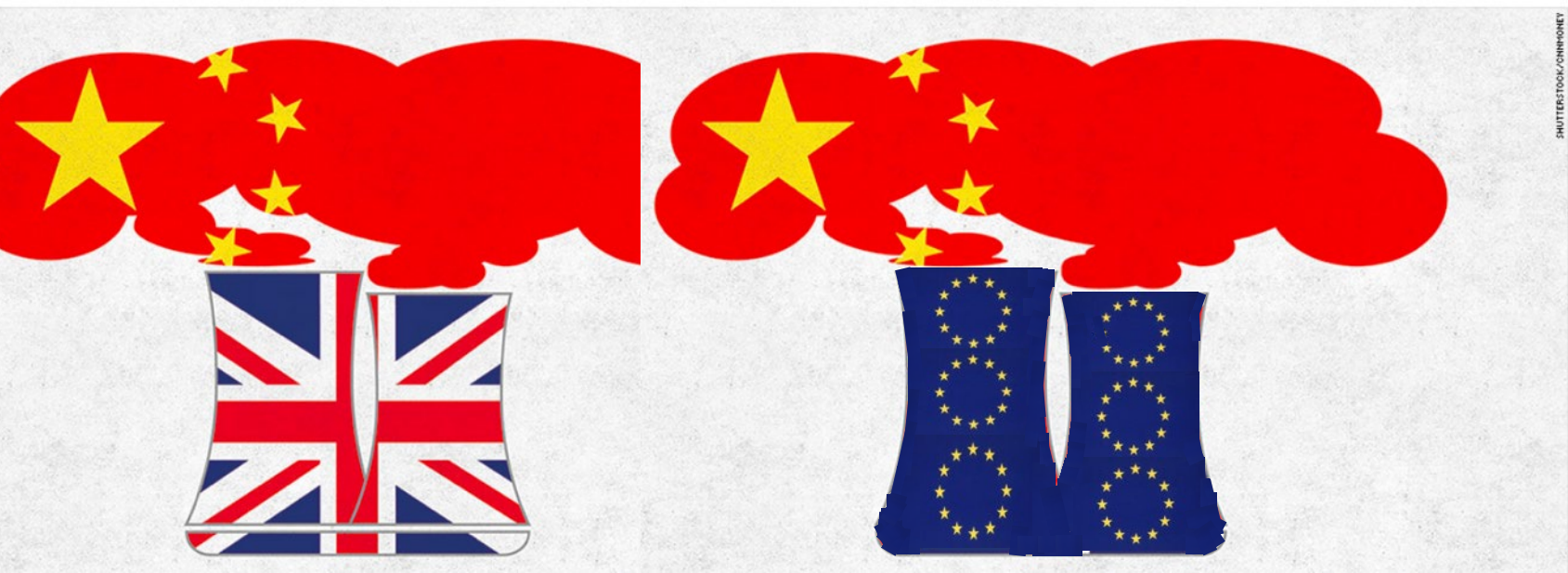


Alexei Tschékounkov (Russian Minister for the Far East): 4 other floating nuclear PP
Baimsky copper extraction and processing plant in Chukotka, in the far north-east
of Siberia.

Taishan 1 and 2: the first EPR reactors are Chinese



Operational: Dec 2018 Taishan 1 and Septebre 2019 Taishan 2 2x 1750 MW
Contract signed in Nov 2007 → 11/12 years (+5 years!)
12,2 G€ (+60% of budget)



*This is our
independently
developed
technology, we will
introduce it in Africa
and the rest of the
world*

CNN Money Markets Economy Companies Tech Autos India Video International

China will own part of new U.K. nuclear power plant

by Charles Riley and Jethro Mullen @CNNMoney

September 15, 2016: 7:02 AM ET

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CNN BUSINESS

Personal Finance

Mortgage Personal Loans



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Turkey Point 2&3 are now licensed to operate until 2052 and 2053



Nuclear plants could safely operate for 100 years, suggests Grossi

09 November 2022



As the nuclear sector takes its place at the COP27 gathering, the International Atomic Energy Agency's director general says that Long Term Operation (extending the lifetime of existing nuclear plants) is the "unsung hero of the fight against global warming".

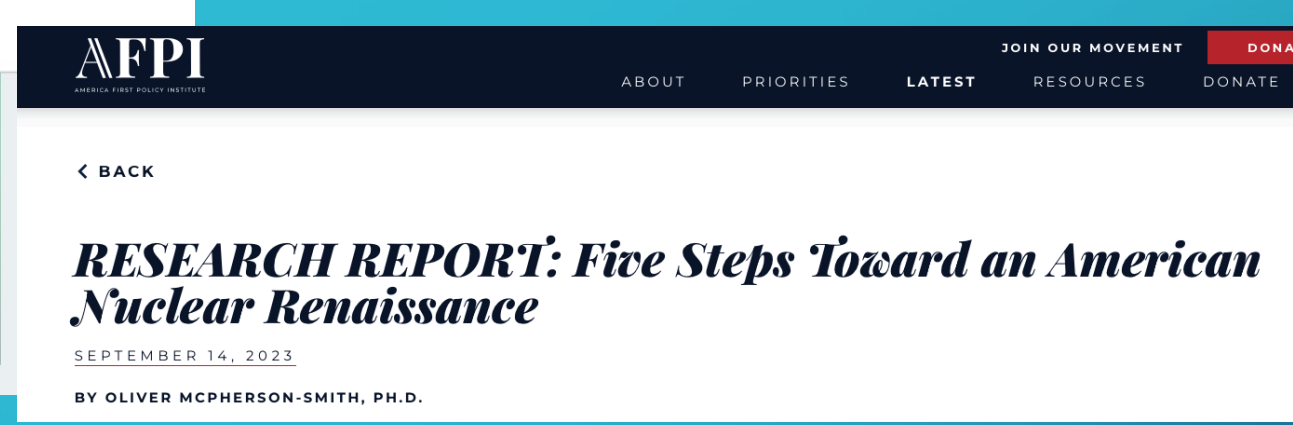


LTO (Long Term Operation) reduces nuclear costs



Obama, Steven Chu (Nobel price) and Ernest Moniz (MIT professor)





1. Permitting reform to spur further domestic uranium production

2. Nuclear reactor licensing procedures (latest scientific knowledge)

4. The Nuclear Regulatory Commission's mandate, and the deployment of its resources, should explicitly support the expansion of domestic nuclear power.

5. Granting a generic nuclear cooperation agreement to countries that have mutual defense treaties with USA

Westinghouse signs initial contract for Ukrainian AP1000s

22 November 2021



A contract signed by the Ukrainian nuclear operator Energoatom and US vendor Westinghouse will trigger the engineering and procurement of components for the first of several AP1000s planned for Ukraine. The country is planning as much as 11 GWe of new build by 2040.



Patrick Fragman (seated left) and Petro Kotin (seated right) sign on behalf of Westinghouse and Energoatom, respectively (Image: Energoatom)





Article 194.3

Nuclear is a fossil
fuel
[interview L'Opinion
4 nov 2021]

Nucléaire : la France, la Pologne et la Roumanie écrivent à l'UE pour défendre la filière

NUCLÉAIRE

SUIVRE CE SUJET



Pixabay

SAUVEGARDER PARTAGER

Défendant le rôle de l'énergie nucléaire en Europe, Emmanuel Macron et les Premiers ministres de Hongrie, Pologne, République Tchèque, Roumanie, Slovaquie et Espagne ont envoyé une lettre commune à la Commission européenne.

Réinventer le nucléaire



Le président souhaite que l'apport de l'énergie nucléaire dans la lutte pour le climat soit accepté dans les textes européens. Une fois pour toutes.



Par Emmanuel Berretta



00



Euratom 2.0



Paris, 16 mai 2023, Nuclear alliance aims for 150 GW of nuclear capacity in EU by 2050

Kabinet: versneld twee nieuwe kerncentrales in Borssele



9 december 2023

Borssele voorkeurslocatie voor twee nieuwe kerncentrales

Nieuwsbericht | 09-12-2022 | 15:30

Het kabinet heeft Borssele als voorkeurslocatie aangewezen voor de komst van twee nieuwe kerncentrales. De eerste voorbereidingen worden gestart voor de bouw van twee kerncentrales van de derde generatie. Op basis van de voorlopige inzichten zullen deze rond 2035 afgerond zijn en elk een vermogen van 1000 tot 1650 megawatt hebben. Daarmee zouden de twee reactoren in 9 tot 13 procent van de elektriciteitsproductie voorzien in 2035. Het kabinet bereidt daarnaast de bedrijfsduurverlenging van de bestaande kerncentrale in Borssele voor, zodat deze ook na 2033 veilig in bedrijf kan blijven.

Il ministro dell'Ambiente: "Le rinnovabili non bastano, serve il nucleare. Il referendum? Le cose sono cambiate"

21 Settembre 2023



Le nucléaire en Pologne, une opportunité pour la France et le climat

Publié le 11 février 2020 - Mis à jour le 28 septembre 2021



Europe France Pologne



News | September 22, 2023

Westinghouse and Bechtel team up to build Poland's first nuclear plant

Poland chose Westinghouse's AP1000 pressurised water reactor technology for the project.



w n n
world nuclear news

Energy & Environment | **New Nuclear** | Regulation & Safety | Nuclear Policies | Corporate | Uranium & Fuel | W

Polish government approves first nuclear power plant

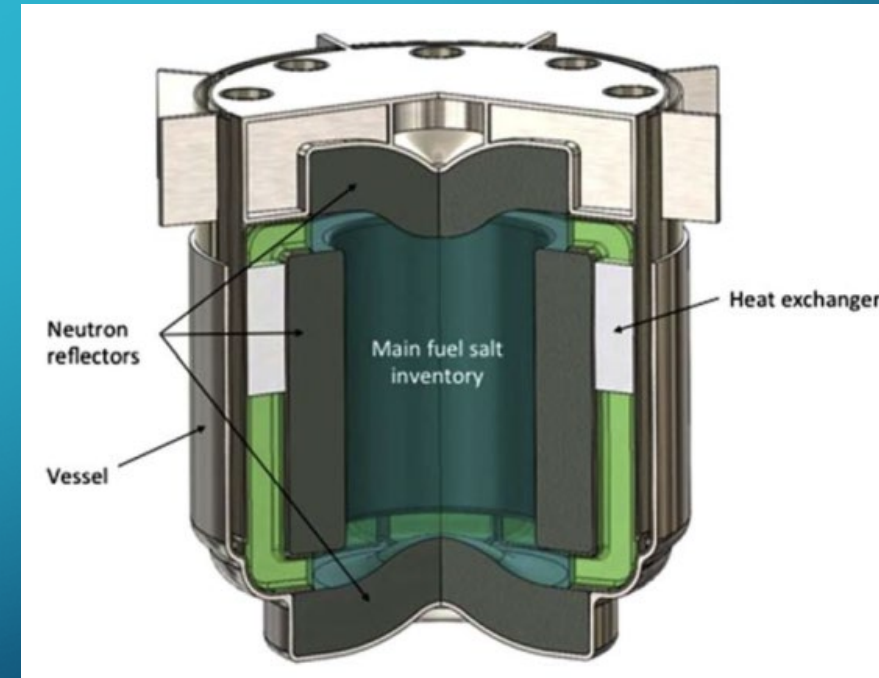
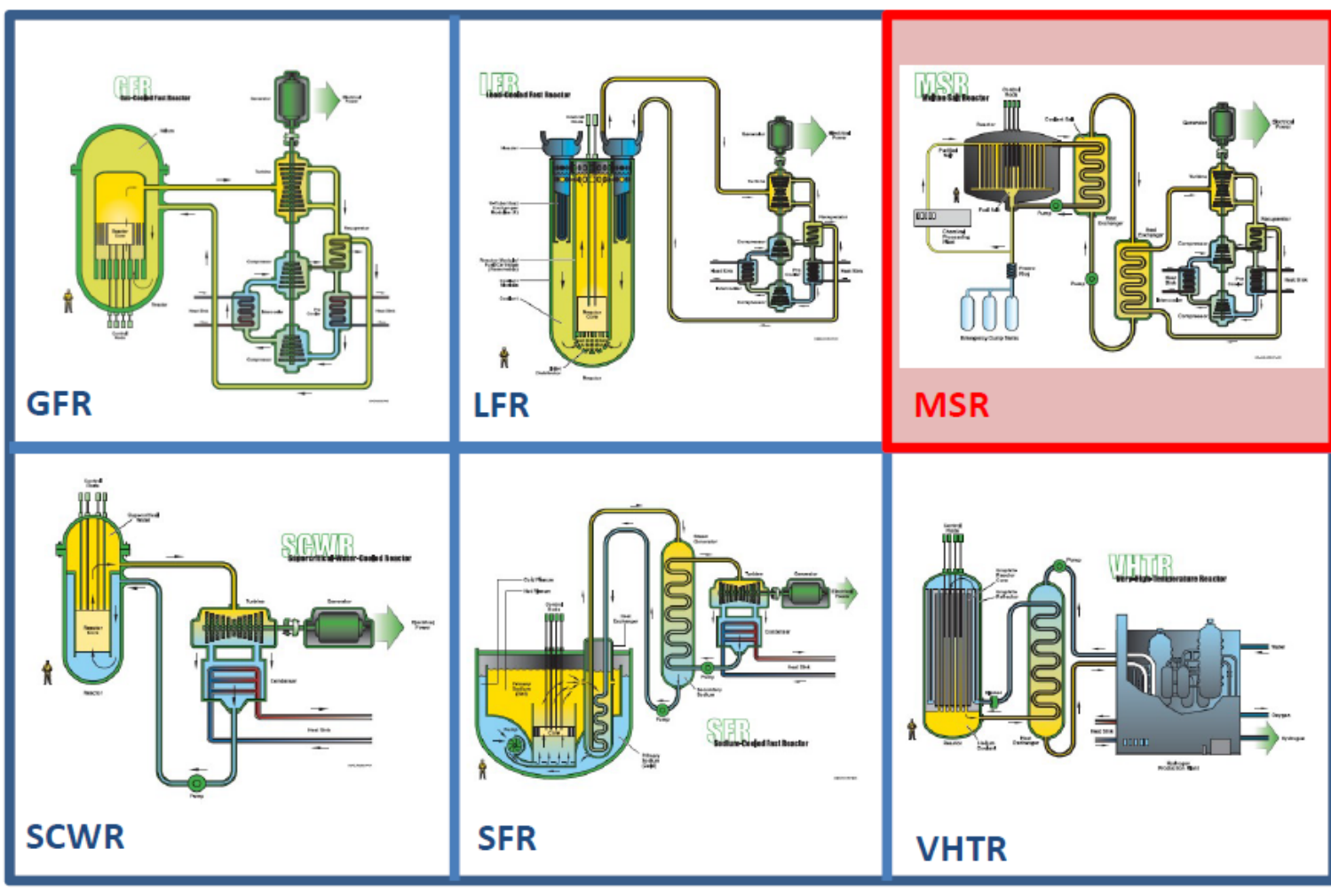
12 July 2023



Poland's Ministry of Climate and Environment has given a decision-in-principle for Polskie Elektrownie Jądrowe (PEJ) to construct a nuclear power plant in Pomerania. It is a formal confirmation that the company's investment project is in line with the public interest and the policies pursued by the state, including energy policy.

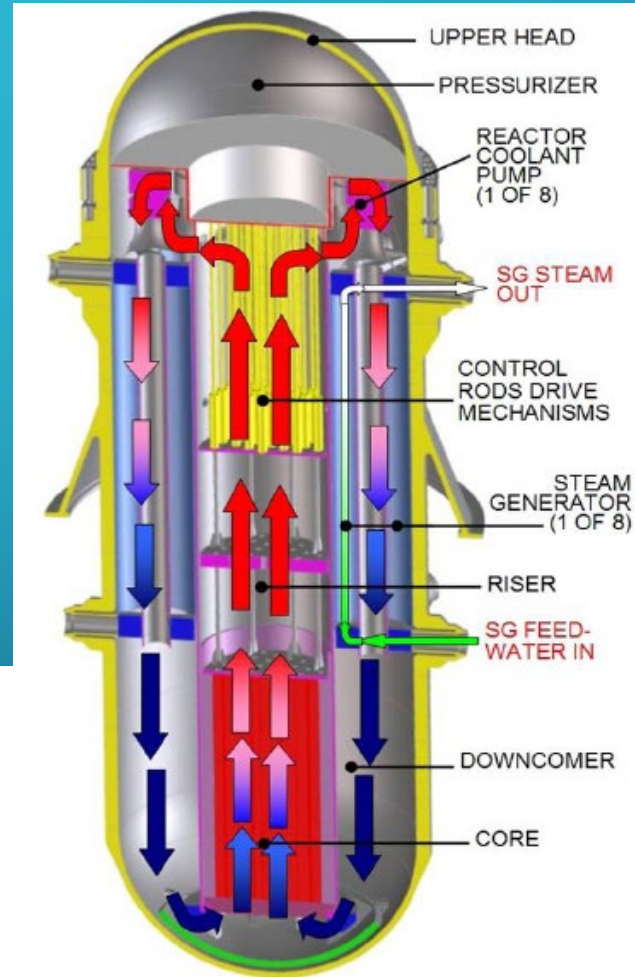


Gen-IV and its 6 families



SMRs, a solution for small markets and the integration of renewable energies

Currently, more than 80 SMR models are being developed for advanced applications and at different stages of development, according to the IAEA.



No LOCA

Source: IAEA 2022 (SMR Booklet - preprint)

SAMUEL FURFARI



Nuclear? Not only for electricity

Eur. Phys. J. Plus (2022) 137: 747

<https://doi.org/10.1140/epjp/s13360-022-02980-5>

Regular Article

Advanced nuclear power for clean maritime propulsion

Samuel Furfari¹ and  Ernest Mund^{2b}

¹ Université Libre de Bruxelles, Brussels, Belgium

² FNRS and Université Catholique de Louvain, Brussels, Belgium

New Nuclear
for Maritime



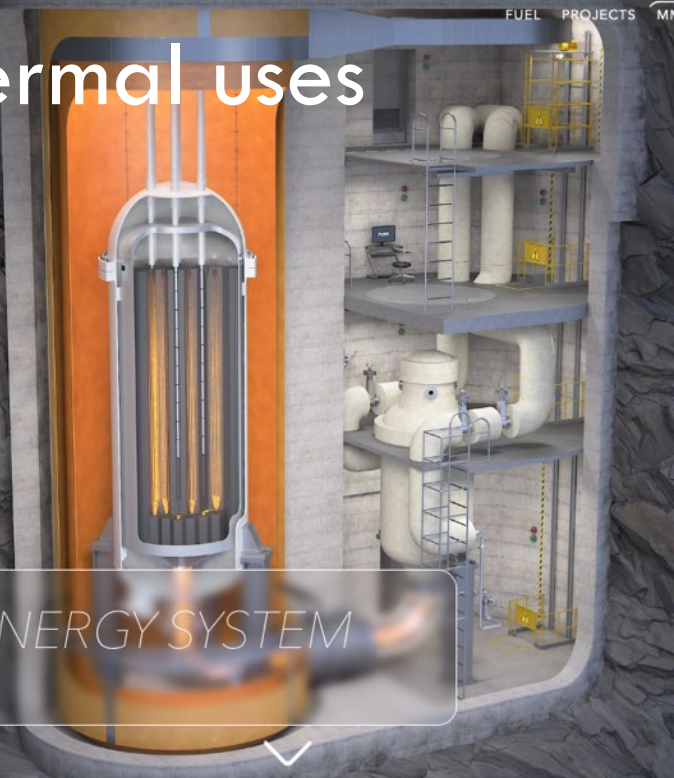
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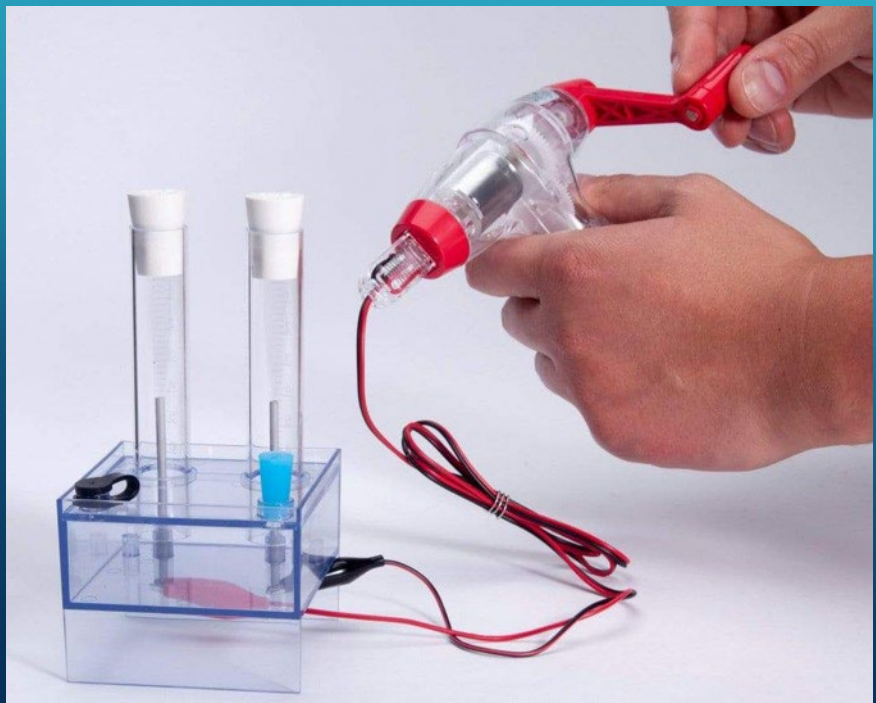


Erice, 23/08/2023

ESCP
EUROPE



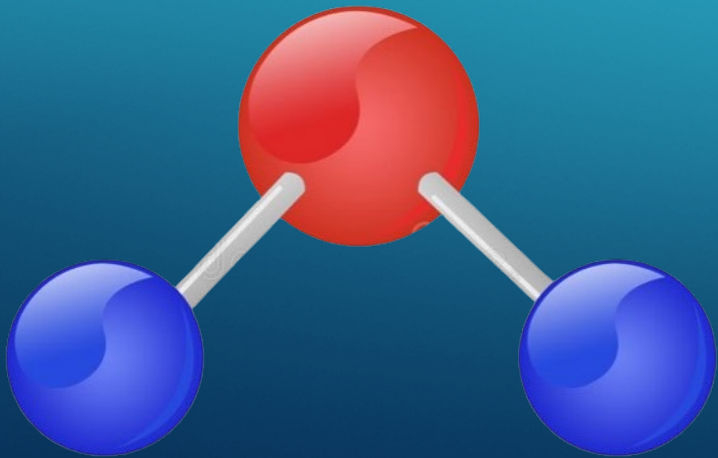
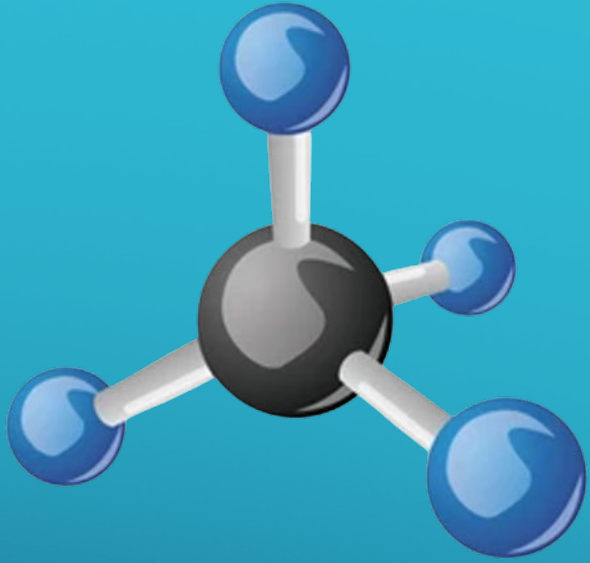
SAMUEL FURFARI



Air Liquide celebrates next generation SMR-X (Steam Methane Reformer) hydrogen plant start-up in Antwerp Belgium
April 22, 2021

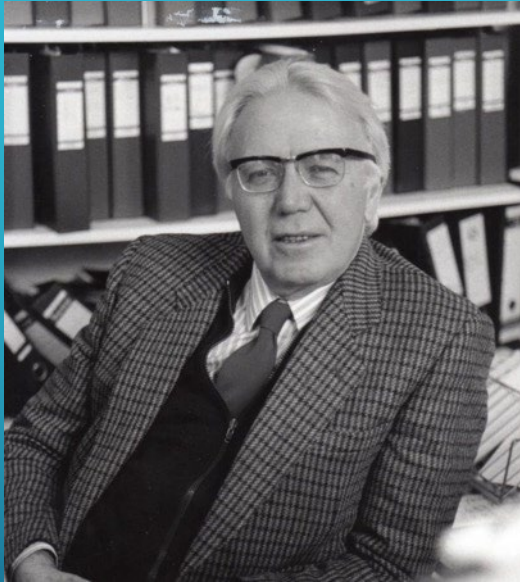


Why is hydrogen mass-produced through the conversion of methane?

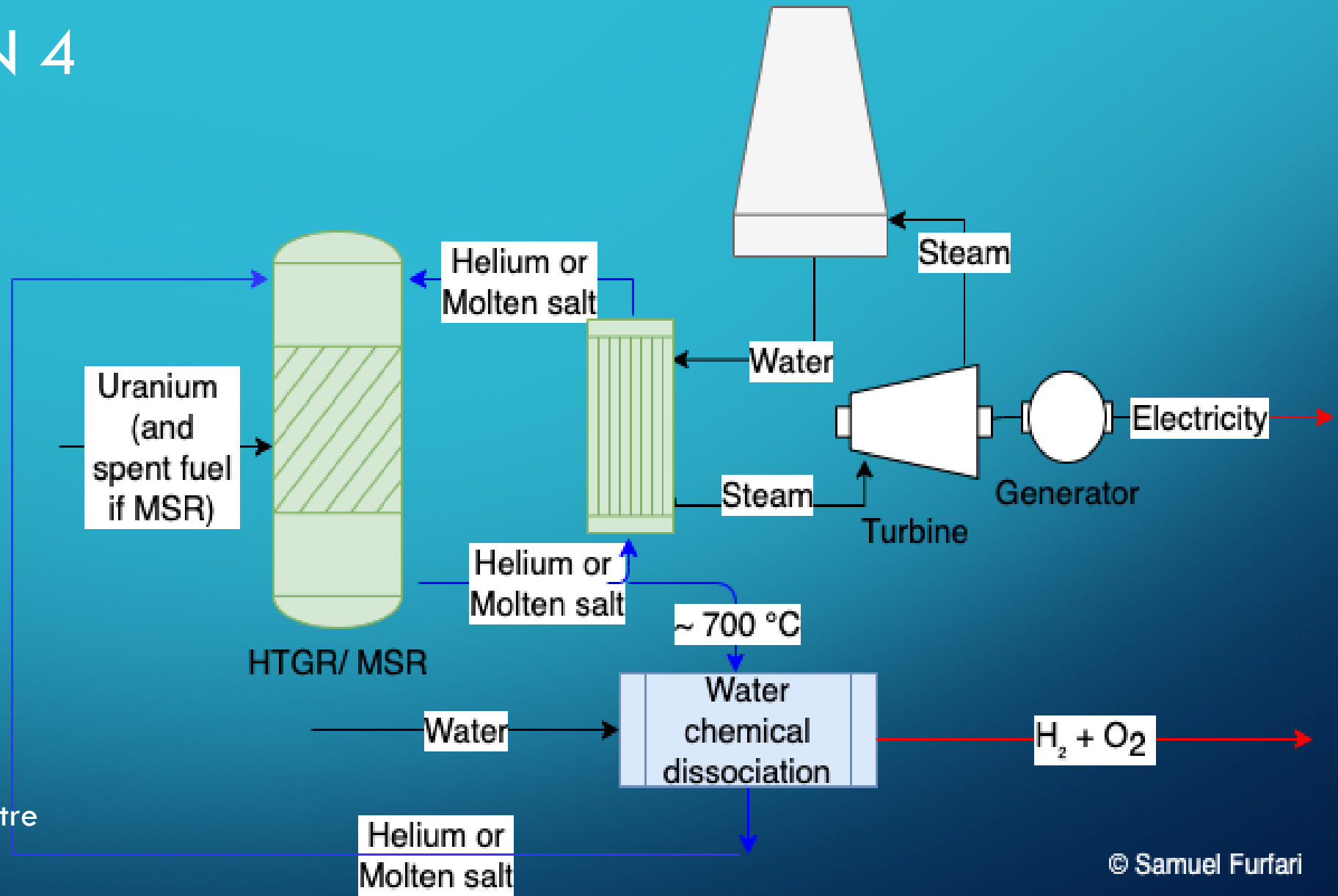


$$\frac{4 \times 285.8}{164.7} = 6.9$$

H₂ future? GEN 4



Cesare Marchetti,
Ispra,
European Common Research Centre



© Samuel Furfari



WELT+

NEUER EU-KLIMAKOMMISSAR

„Klimaneutralität ist nur mit Atomenergie zu erreichen“

Stand: 22.09.2023 | Lesedauer: 3 Minuten



Von **Stefanie Bolzen**

Korrespondentin in Washington



285

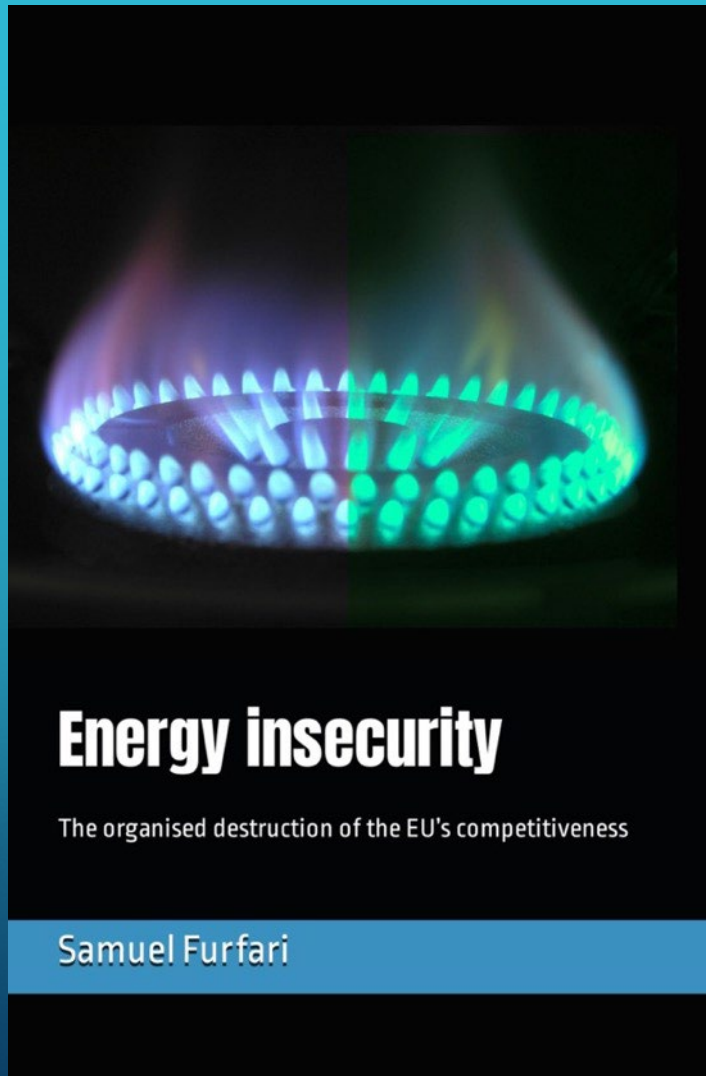


Maros Sefcovic (57) ist seit 2009 Mitglied der EU-Kommission und betreut nun auch die Klimapolitik

Quelle: picture alliance / empics/Liam McBurney

The Slovakian Maros Sefcovic has been responsible for the EU's climate policy for a few weeks - and immediately caused a stir with his assessment of nuclear power. Without it, the climate goals would not be achievable, he told WELT. And he admits that Brussels needs to listen more to its citizens.

Obrigado pela vossa atenção



sfurfari@escp.eu

The destruction of the EU nuclear industry

