25th REFORM Group Meeting, Salzburg
October 3. – 6. 2022

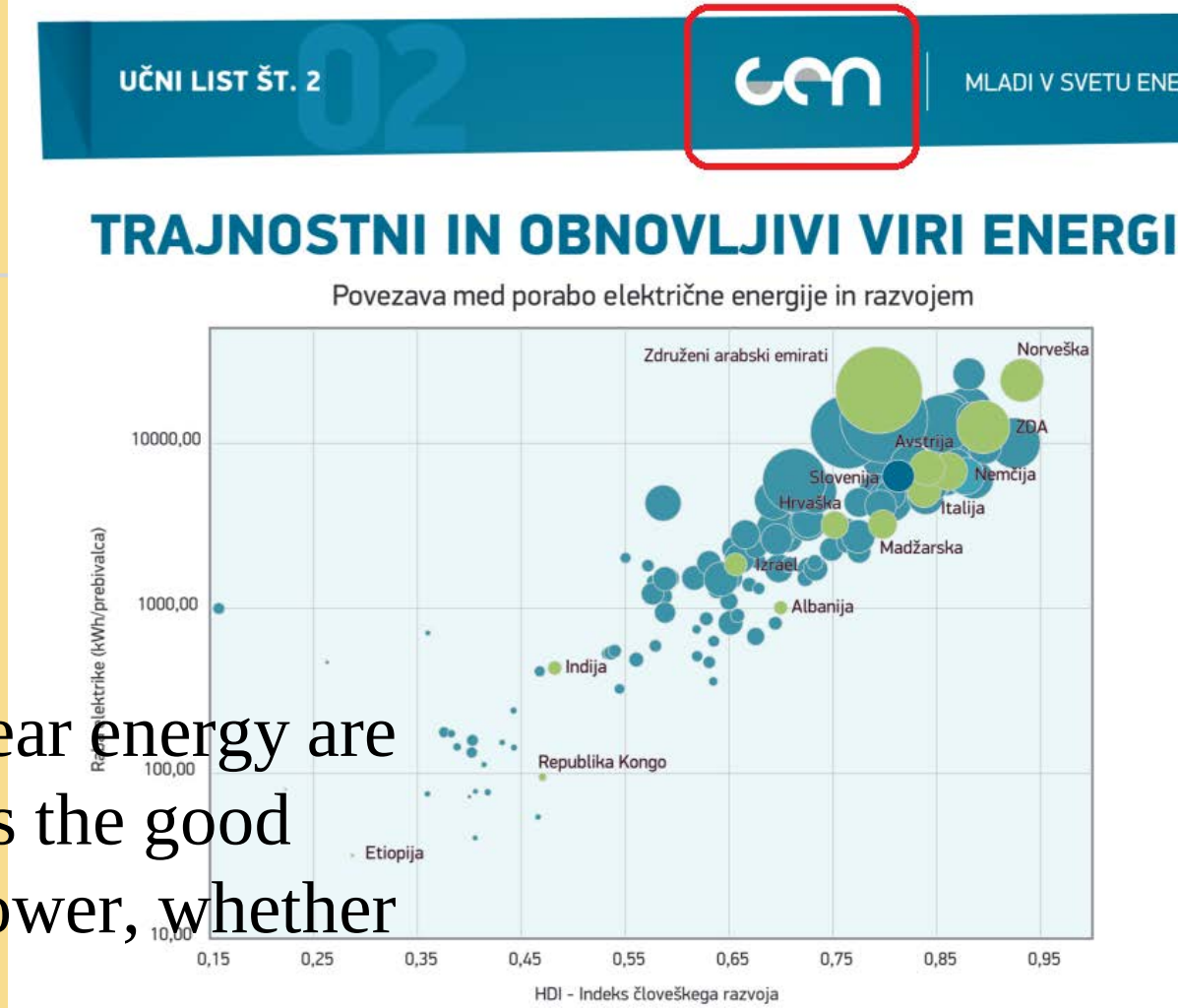
Energy transition in Slovenia: renewable energy sources against nuclear energy

Matjaž Valenčič

Union of Ecological Movements of Slovenia-ZEG

www.zaensvet.si matjaz.valencic@gmail.com

Nuclear kids



- Proponents of nuclear energy are constantly telling us the good points of nuclear power, whether it is true or not.
- Slovenian nuclear lobbyist are trying to indoctrinate also children from the age of 6!

Frightened?

Shameless nuclear lobbyists

NUCLEAR MONITOR

May 4, 2022 | Issue #900

A PUBLICATION OF WORLD INFORMATION SERVICE ON ENERGY (WISE) AND THE NUCLEAR INFORMATION & RESOURCE SERVICE (NIRS)

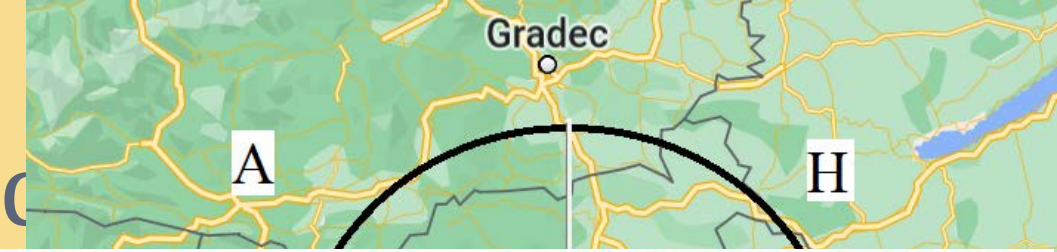
WISE / NIRS Nuclear Monitor

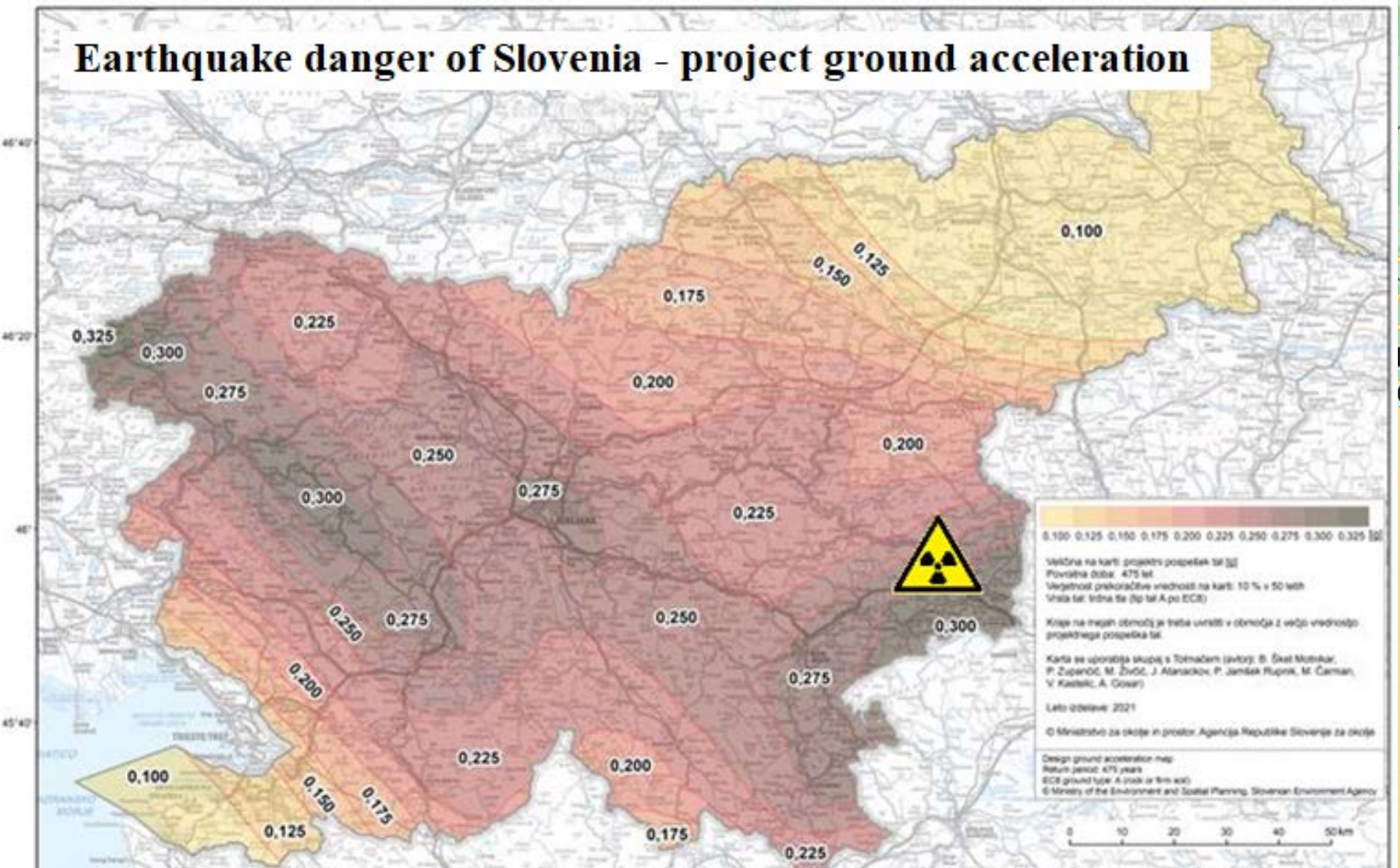
The World Information Service on Energy (WISE) was founded in 1978 and is based in the Netherlands.

The Nuclear Information & Resource Service (NIRS) was founded in the same year and is based in the U.S. WISE and NIRS joined forces in the year 2000 to produce Nuclear Monitor.

Monitored this issue:

On the sunny sic





KRŠKO NPP GOVERNANCE 50:50

SLOVENIAN MINISTRY OF INFRASTRUCTURE

CROATIAN MINISTRY OF ECONOMY AND SUSTAINABLE DEVELOPMENT

INTERSTATE COMMISSION

HEP 50 %

GEN ENERGIJA 50 %

ASSEMBLY 1+1

SUPERVISORY BOARD 3+3

MANAGEMENT BOARD 1+1

NUCLEAR SAFETY OVERSIGHT

SLOVENIAN NUCLEAR SAFETY ADMINISTRATION

SLOVENIAN MINISTRY OF ENVIRONMENT & SPATIAL

INDEPENDENT SAFETY ENGINEERING GROUP - ISEG

KRŠKO SAFETY COMMITTEE

WANO IAEA

All SI politics support nuclear

- All parliamentary political parties support the nuclear program. Also, professional state institutions are extremely kind to nuclear energy.
- The Slovenian Nuclear Safety Administration *URSJV*:
  - **did not inform the public** about INES1 event in 2019;
  - conceals the intended **violations of the legislation** on the disposal of nuclear half of waste to Croatia by 2025.
  - The URSJV obeys the dictates of the nuclear lobby, which it does not even hide. He calls **nuclear risk** a "**challenge**".
- It seems that Slovenia is a **hostage of the nuclear lobby**.

Nuclear

Od: Matjaz Valencic <matjazvalencic@gmail.com>
Date: V čet., 31. mar. 2022 ob 16:52
Subject: Fwd: Sporočilo s spletne strani
To: <varuh@rtvslo.si>, <Jadranka.Rebernik@rtvslo.si>

Gospodarstvo ›

T. K. B.

19. september 2022 ob 22:33
Krško - STA

NEK v soboto dosegel 500 dni neprekinjenega de s polno zmogljivostjo

Nukl … monta med 1. oktobrom in 2. nove
sobo … ljivosti, so sporočili iz NEK-a.

Kot s … *vnosti in timskega dela vseh sodelavce*
in po … ciklom spoprijemali s pandemijo
covic … *o obdobje deloval na polni moči in s*
svojo … *anje elektroenergetskega sistema tudi v*
zaost

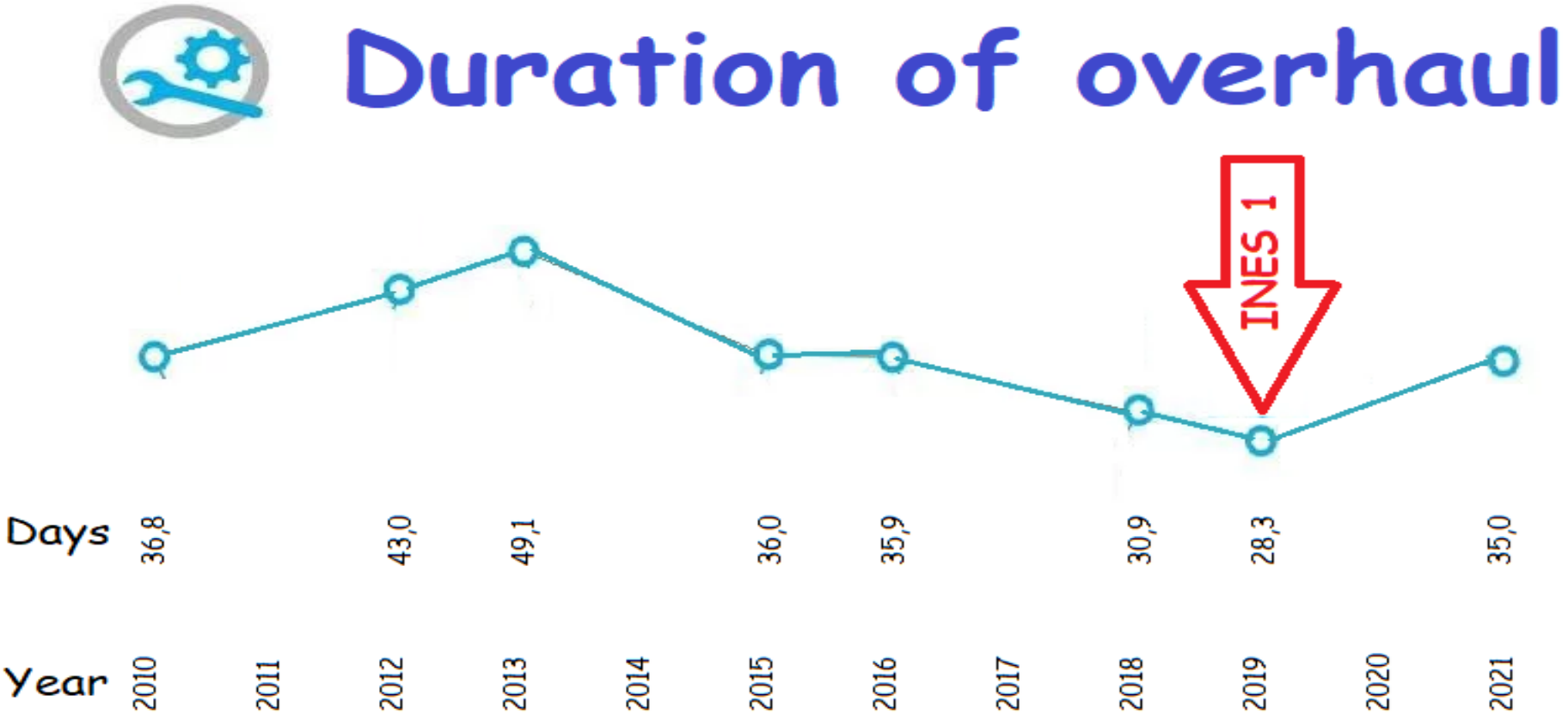
NEK, which produces close to 40 percent of all energy in the country, ...

NEK, ki proizvede blizu 40 odstotkov vse energije v državi, pokrije približno petino potreb po elektriki in z enakomernim stalnim delovanjem skrbi predvsem za osnovno pasovno energijo v sistemu, bo med 1. oktobrom in 2. novembrom izvedel svoj redni letni remont.

Kot so pretekli teden za STA pojasnili v sistemskem operaterju prenosnega elektroenergetskega omrežja Eles, se bo v tem obdobju povečala odvisnost Slovenije od uvoza električne energije in bo več kot 55-

Nuclear games without borders

- Event Title: **Violation of operating limits and conditions during refuelling**

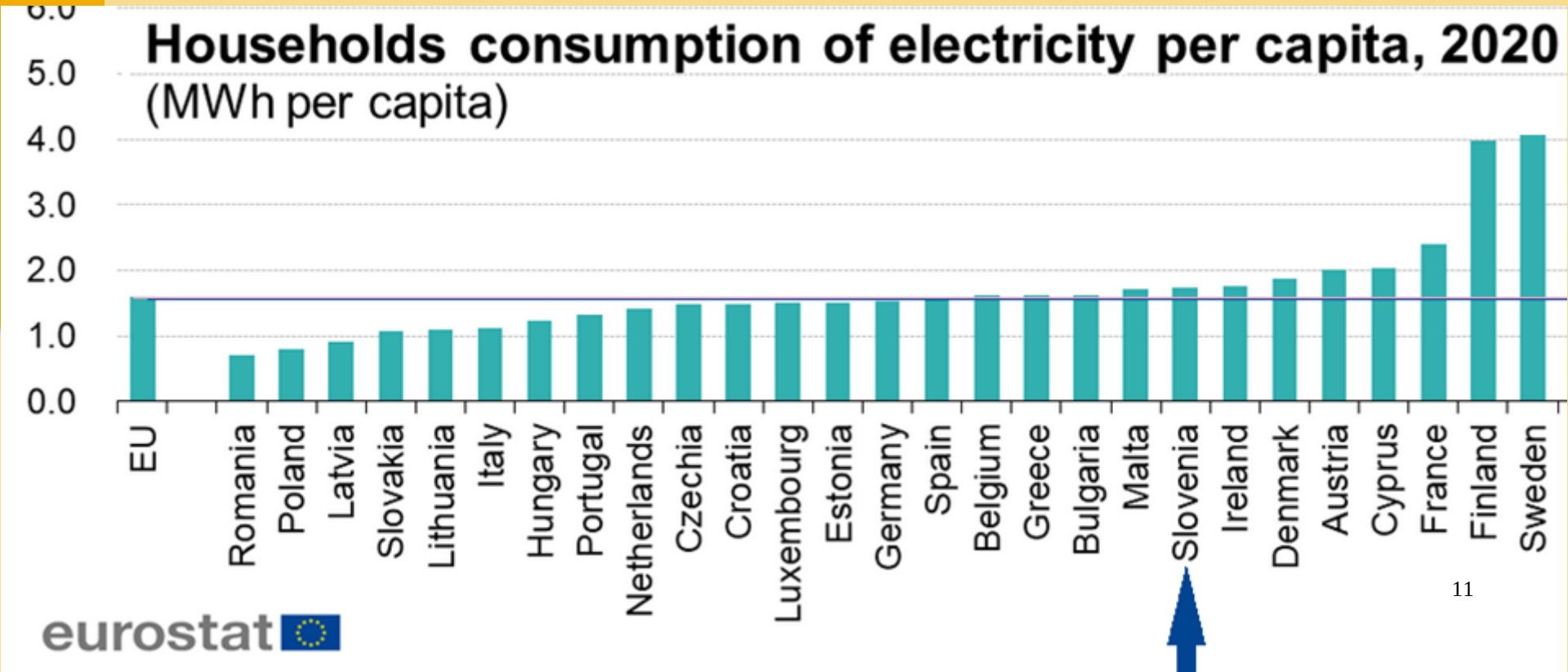


Do we need nuclear energy in Slovenia?

- 50 years ago, we naively believed that nuclear energy is **safe**, reliable and affordable; that science, same time with the use of nuclear energy, would also find **permanent disposal** of nuclear waste. But did not.
- We now know that nuclear energy is neither safe nor reliable nor domestic nor cheap.
  - Side product of NPP is plutonium!
- **All nuclear energy can be replaced by domestic renewables.**
- Renewable energy sources are **sustainable**, more **reliable** and **cheaper** than the nuclear option.

Great potential to reduce energy use

- The use of final energy per capita in Slovenia was 2.33 toe in 2019, which **was 7% higher** than the EU-28 average.
- The final use of electricity in SI is above EU average.



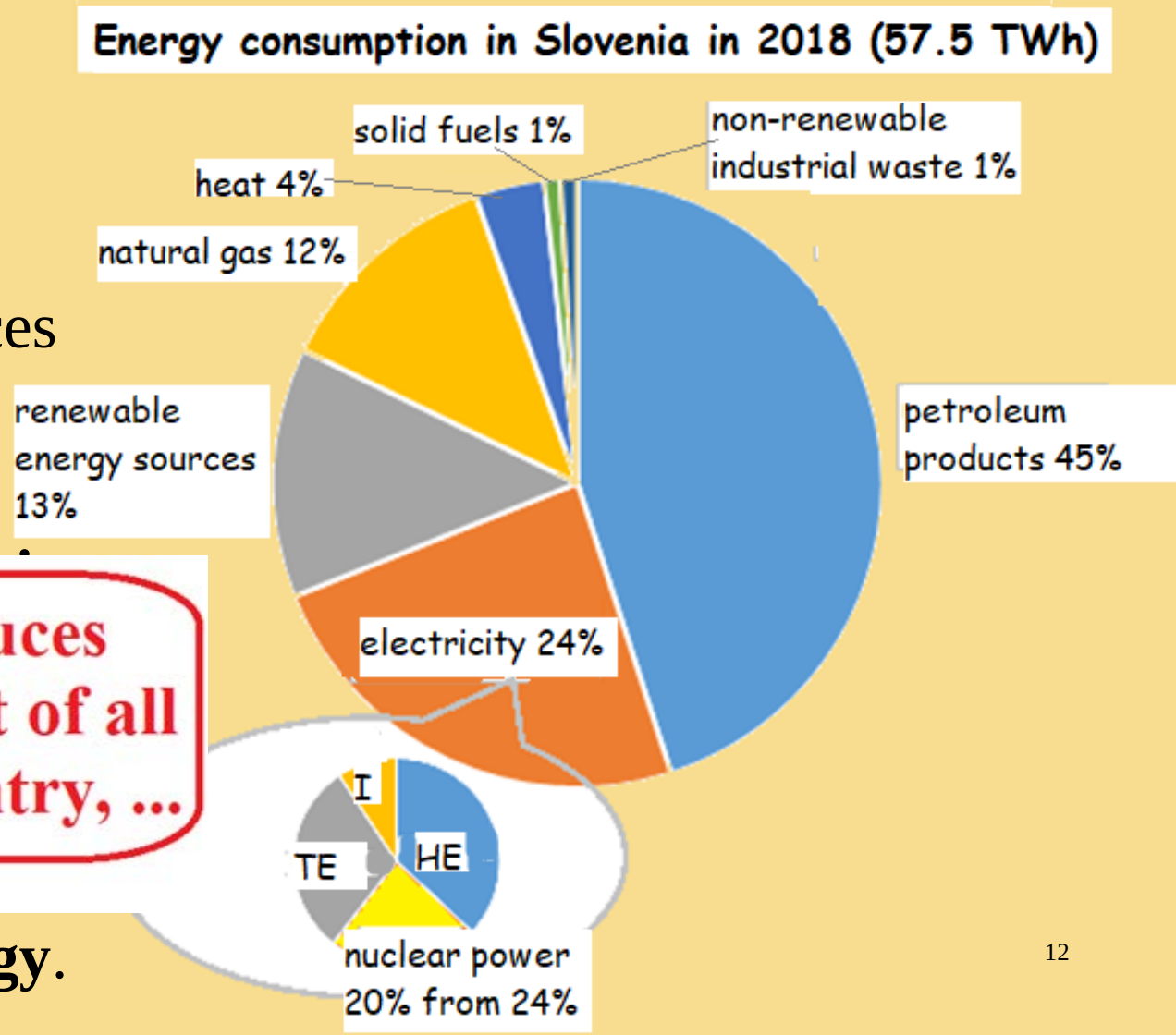
eurostat

Final energy use in Slovenia - 57 TWh

- Slovenian half of NPP NEK produces about 3 TWh/a.
- About **20%** of

NEK, which produces close to 40 percent of all energy in the country, ...

5% of total energy.

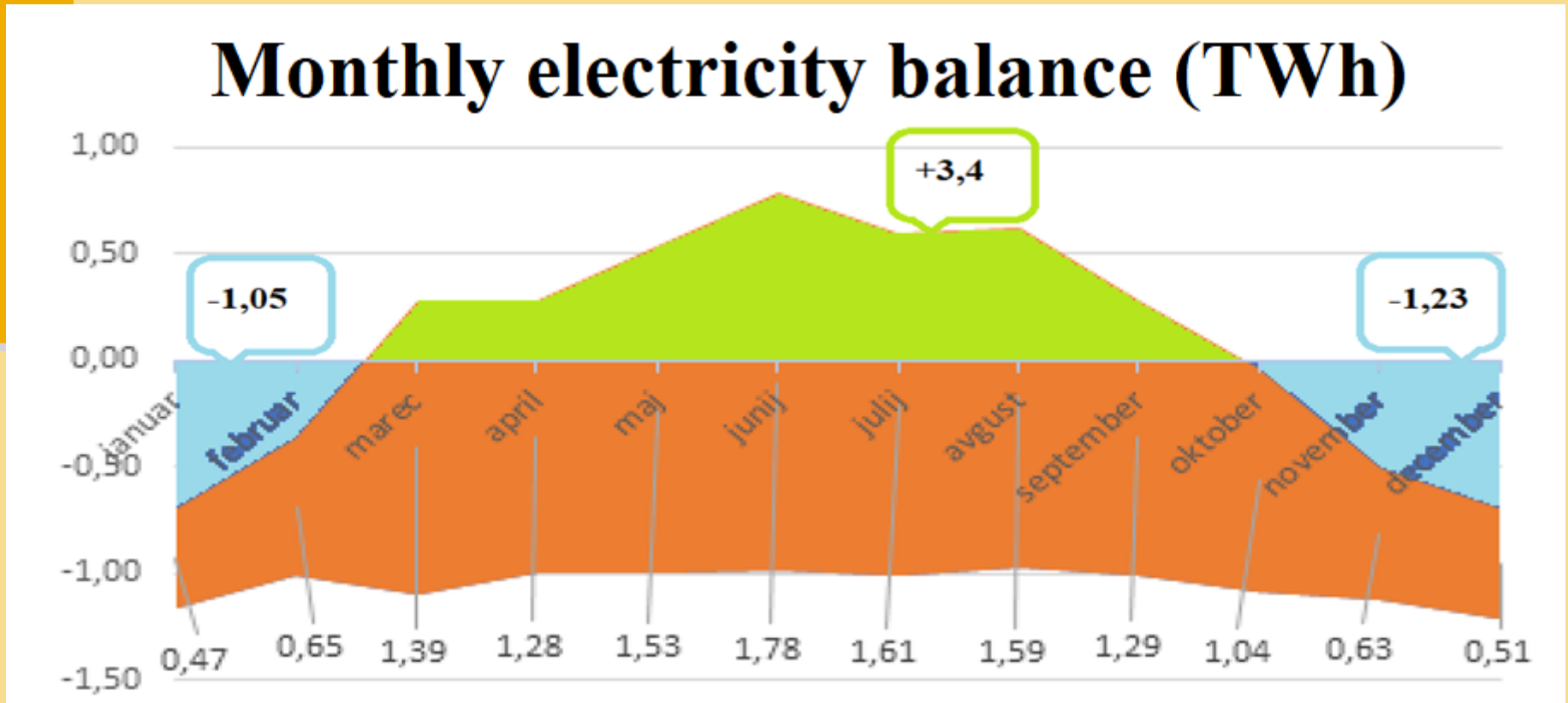


Potential of renewable resources is greater than consumption

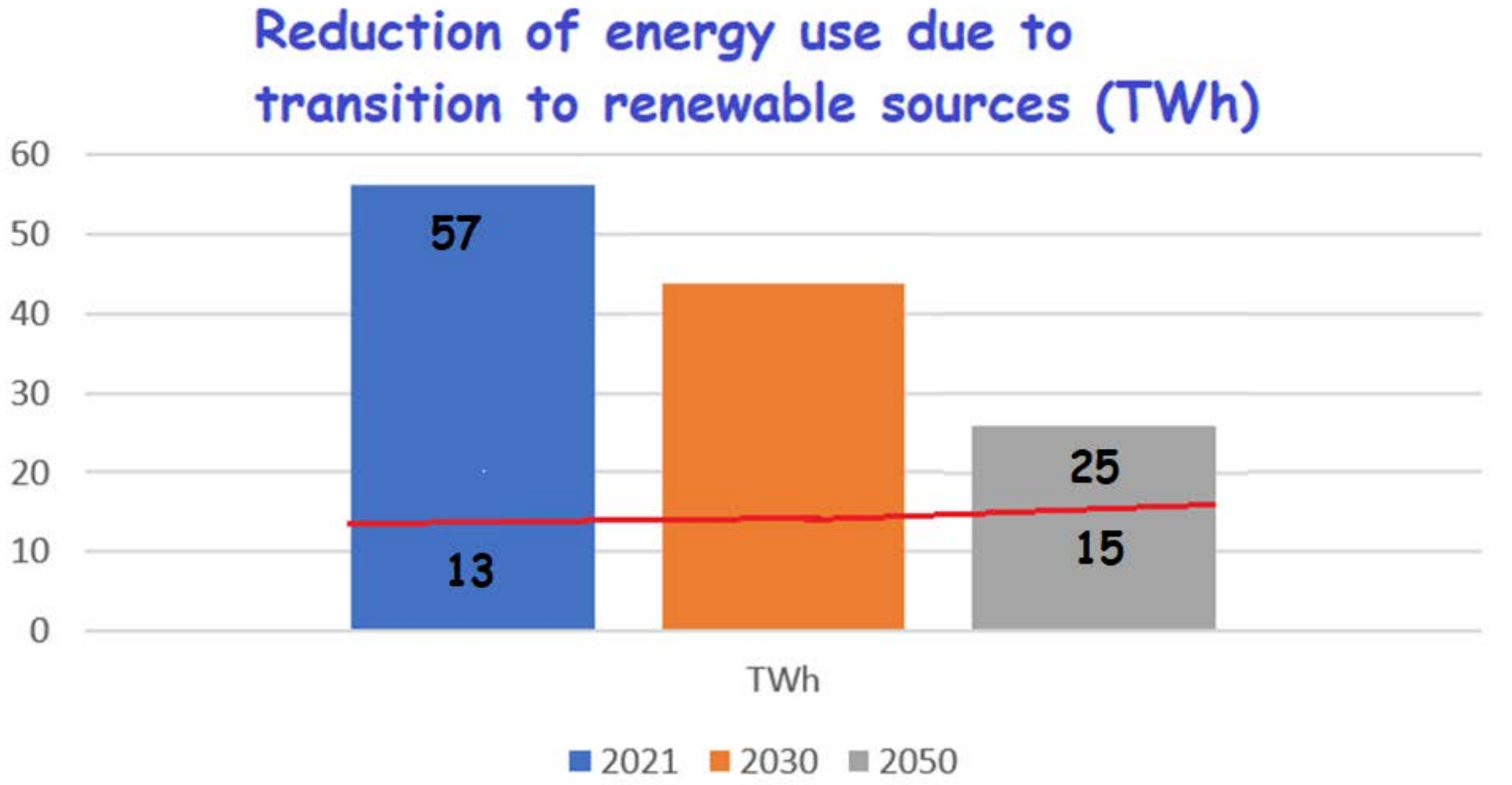
- **Sun** (on buildings, water surfaces, agricultural land, along highways...)
  - Potential of solar power plants in Slovenia, possibility of installation of FV on the roofs of buildings, up to **27 TWh**.
  - Floating solar power plants at HE, **3,7 TWh** (+1,9 TWh).
- **Rivers** (HE potential is only half-utilized, **4,5 TWh**)
- **Wind** (potential for at least **0,8 TWh**)
- **Geothermal** (known potential is **0,3 TWh**)
- **Organic remains** (gasification and use of electricity, carbon circulation, synthetic fuels, methanation, storage and processing) **~ 30 TWh**

Half of the roofs are enough

- By installing solar power plants on half suitable roofs, we can permanently supply Slovenia with electricity from the sun, more than 13 TWh each year.



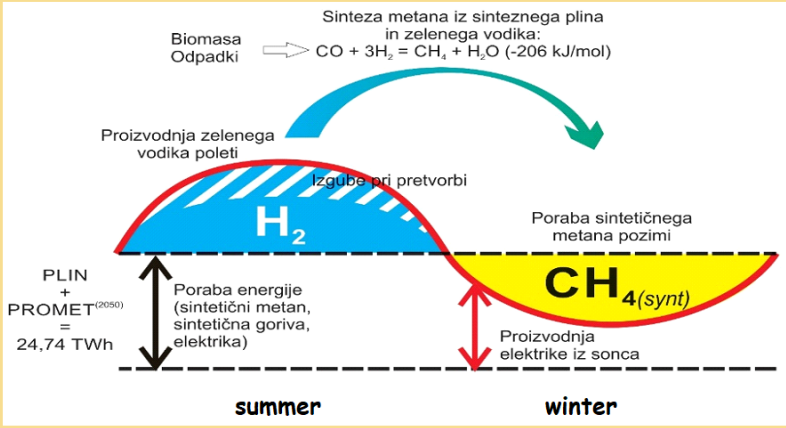
e-cars, heat pumps



Example 1: suitable technologies

- **Floating solar power plants** on damming of rivers
  - Accumulation of water at the HPP dams to produce electricity.
  - All the infrastructure for electrical discharge into the network.
  - Alternating operation of floating FV and HE
  - Possibility to produce hydrogen with electrolysis
  - Combination of **HE + PV + H_2** represent the cheapest accumulation of solar energy and electricity.
  - The price of floating FV is from 600 to 900 €/kW.
  - Short construction time.
- The total electric potential for floating FV is **5,8 TWh**.

Example 2: suitable technologies

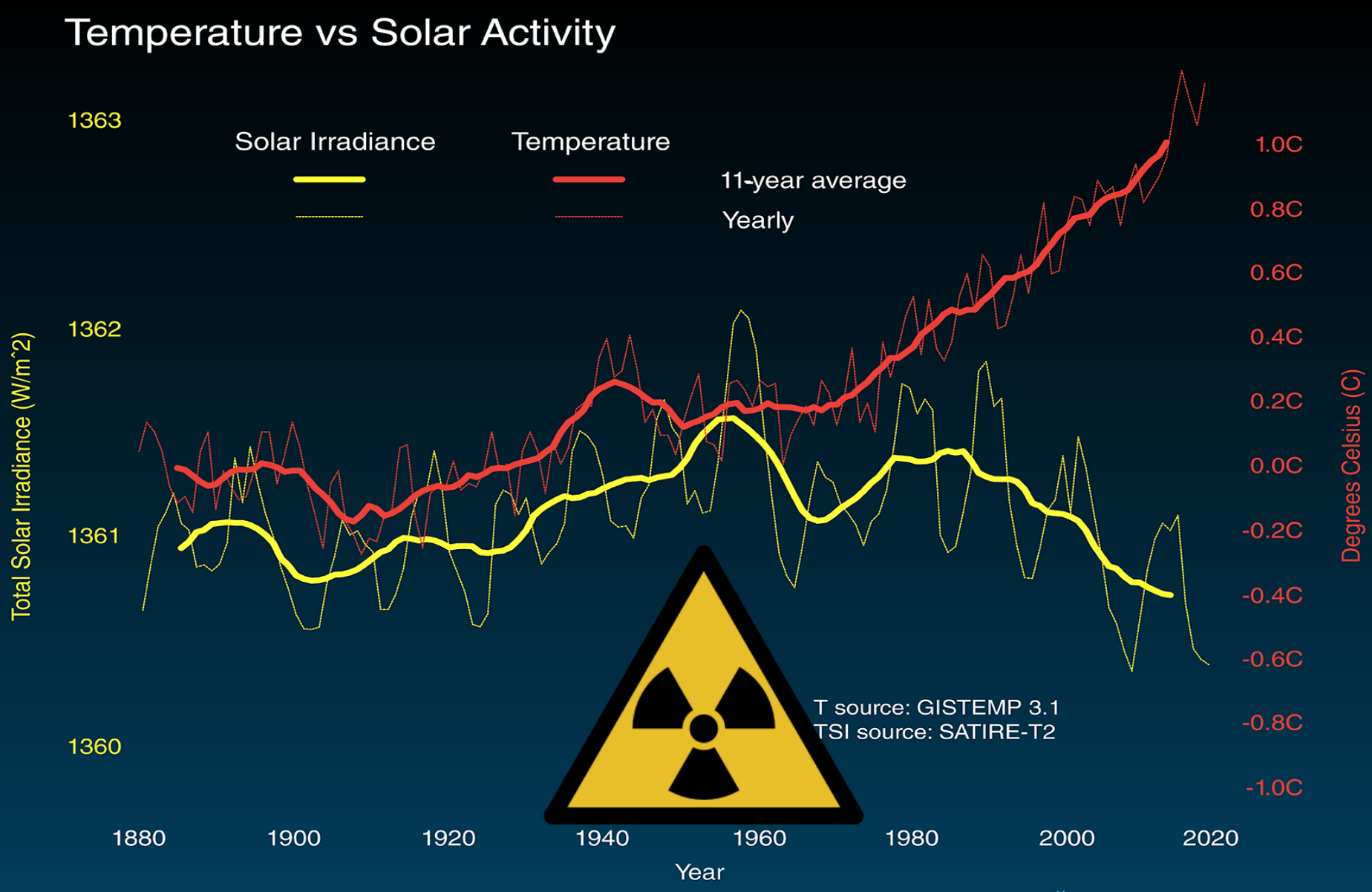


- **Power-to-gas** P2G, methanation.
- Adding green hydrogen (electrolysis) from surplus production of solar power plants to the synthesis gas methanation process is one of the options for seasonal storage of summer surplus energy from renewable energy. During the summer months, FV would produce green hydrogen and synthesis of methane, which would be used in the winter months.
- First step: production of **synthetic gas** from **organic remains**
  - **$C_9H_{18}O_3 + 3O_2 = 9CO + 9H_2$**
- Second step: production of methane (synthesis gas and hydrogen)
  - **$(9CO + 9H_2) + 6H_2 = 5CH_4 + 5H_2O + 4CO$**
- The total electric potential for P2G is **over 30 TWh**.

The fastest way to energy independence

- The roofs solar power plants on buildings, up to **27 TWh**.
- Floating solar power plants at HE, **3.7 ÷5.6 TWh**.
- Hydroelectric power plants (potential at least **4.5 TWh**)
- Wind (potential at least **0.8 TWh**)
- Geothermal (known potential is **0.3 TWh**)
- Organic residues (carbon circulation, gasification, synthetic fuels, storage and processing, **>30 TWh**)
- All this can be built in **10 to 20 years**.

Is **global warming** just a nuclear hoax?



matjaz.valencic@gmail.com
www.zaensvet.si

Money doesn‘t radiate!

- The microphone is yours…

Zveza Ekoloških Gibanj Slovenije

Union of Ecological Movements of Slovenia-ZEG