



**Faculty of Power and
Aeronautical Engineering**

WARSAW UNIVERSITY OF TECHNOLOGY

Opportunities for cooperation in hydrogen research and innovation between the EU and Japan

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**Warsaw University
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Position:

- Head of Power Division
- PhD (habilitated)
- Associate Professor at WUT
- Editor-in-Chief of Journal of Power Technologies
- Member of Editorial Board of Journal of Applied Energy
- Fuel Cell Poland Ltd., co-owner

Activities

- Future power sources
- Fuel cells
- Hydrogen fueled devices

Publications

- 2 books + 3 book chapters
- 300+ articles
- 5 patents

Teaching

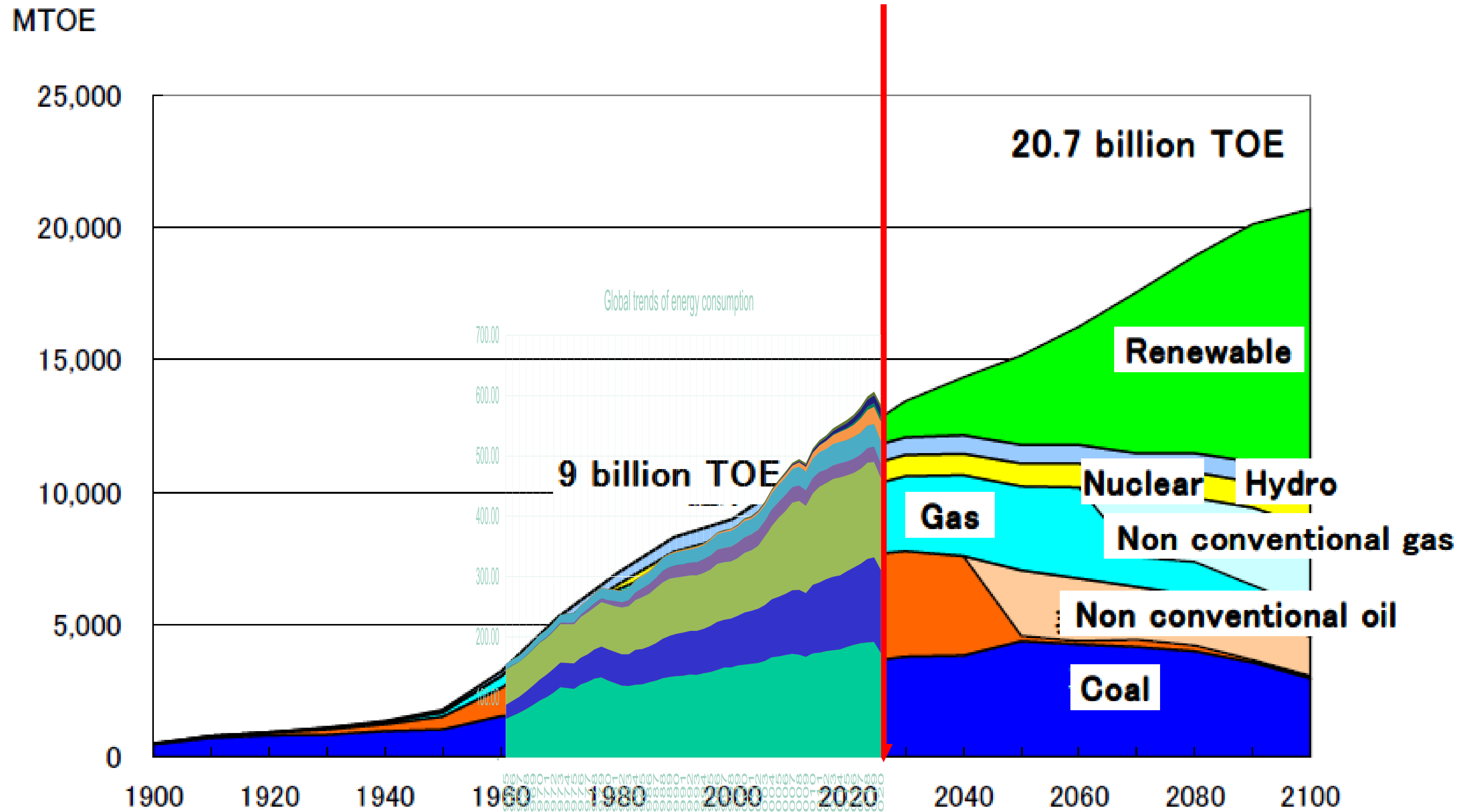
- Turbomachinery
- Power Engineering Software (Aspen, Hysys, GateCycle, Thermoflex, MatLab, MathCad)
- Future oriented Power Technologies



Schematic illustration of WE-NET



Predicting future



Japan and EU and Poland

- The **Japanese** government has announced hydrogen strategies in previous years, with the aim of achieving 800,000 cumulative FCEV sales and establishing 1,000 refueling stations by 2030.
- In addition, hydrogen is a pivotal part of **Japan's Strategic Energy Plan**. However, to date, Japan's strategy remains largely centered around blue hydrogen, derived from fossil fuels.
- **Japan, the European Union,** and 11 other nations have launched national hydrogen strategies and are investing heavily in electrolyzers, fuel cells, and other hydrogen technologies.
- Countries with national hydrogen strategies include Germany, France, Spain, Portugal, the Netherlands, Norway, Japan, Korea, New Zealand, Australia, Canada, and Chile. Italy, **Poland,** and the United Kingdom are currently developing national hydrogen strategies.



Hydrogen valleys in Poland

According to the "Polish Hydrogen Strategy until 2030", **five** hydrogen valleys are to be established in Poland – **seven!** have already started their activities. The valleys are to support local innovation and investment in the area of production, storage, transport and implementation of hydrogen solutions.



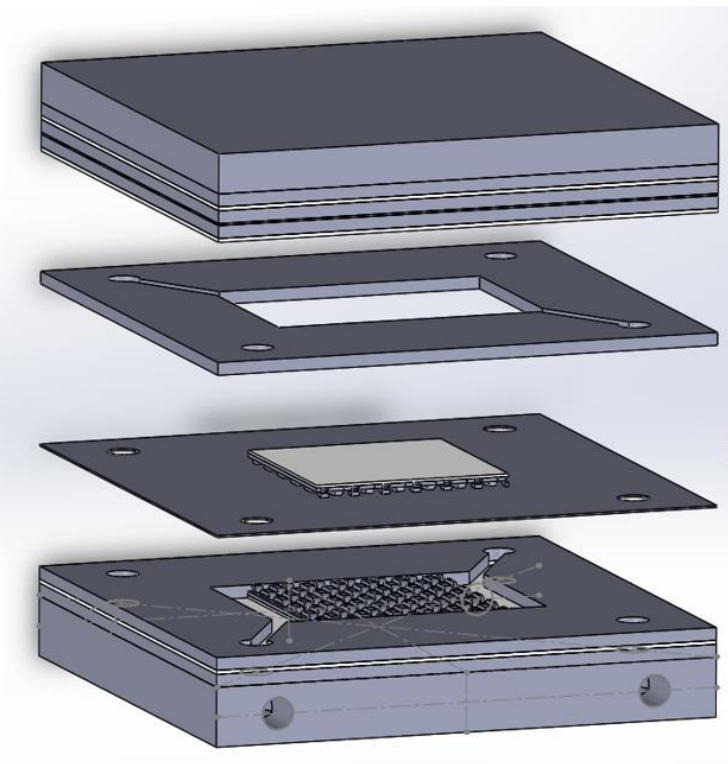
Hydrogen-oriented activities

WUT

- Warsaw University of Technology
 - Molten Carbonate Fuel Cells
 - Proton Conducting Solid Oxide Fuel Cells
 - Hydrogen Gas Turbines
 - Hydrogen Steam Turbines (Japan)

Fuel Cell
Poland

- Fuel Cell Poland Ltd.
 - Molten Carbonate Fuel Cells
 - Proton Conducting Solid Oxide Fuel Cells
- Institute of Power Engineering
 - Solid Oxide Fuel Cell/Electrolysis



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National programmes in Poland



National Centre for Science

- SUGI: 3 different countries including Japan
- OPUS: non-funded collaboration
- MINIATURA: scholarships in Japan



National Agency for Educational Exchange

- Bilateral, young researchers, 5 days .. 12 months

CANON foundation



- Scholarships

EIG CONCERT-Japan

- Hydrogen in 2021



National Centre for Research and Development

- Visegrad Group (V4)-Japan: Advanced Materials
- Japan Coal Energy Centre (JCOAL)
- Moonshot R&D