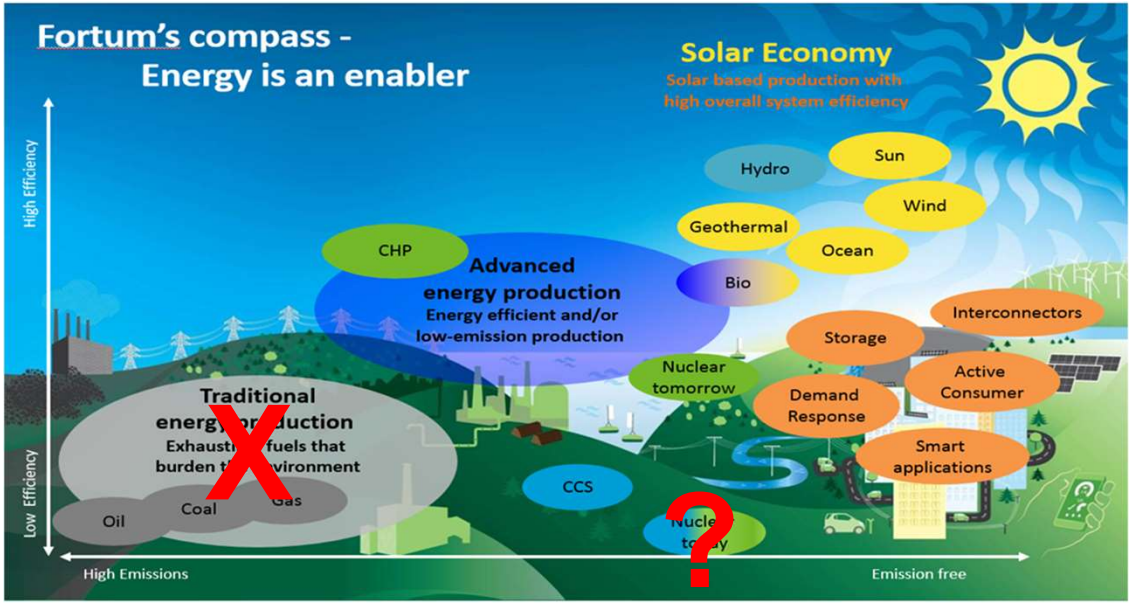
RENEWABLE POWER-TO-X ECONOMY

Drivers for the energy transition

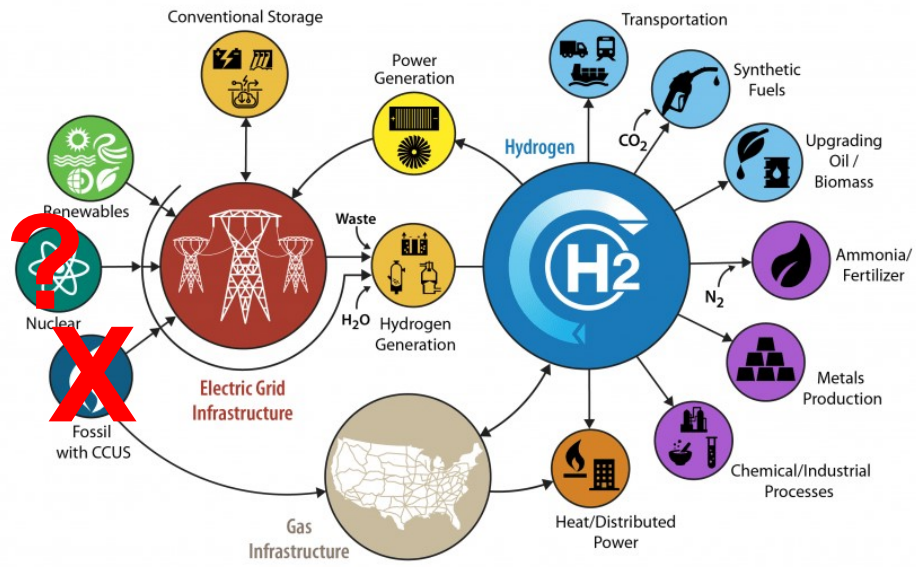
- Climate change mitigation
- Phasing out fossil fuels
- Geopolitics / National energy security
- International agreements and commitments
- Maintaining reasonably energy prices
- Industrial competitiveness
- Promotion of innovation
- Sustainability

What is Renewable Power-to-X Economy ?

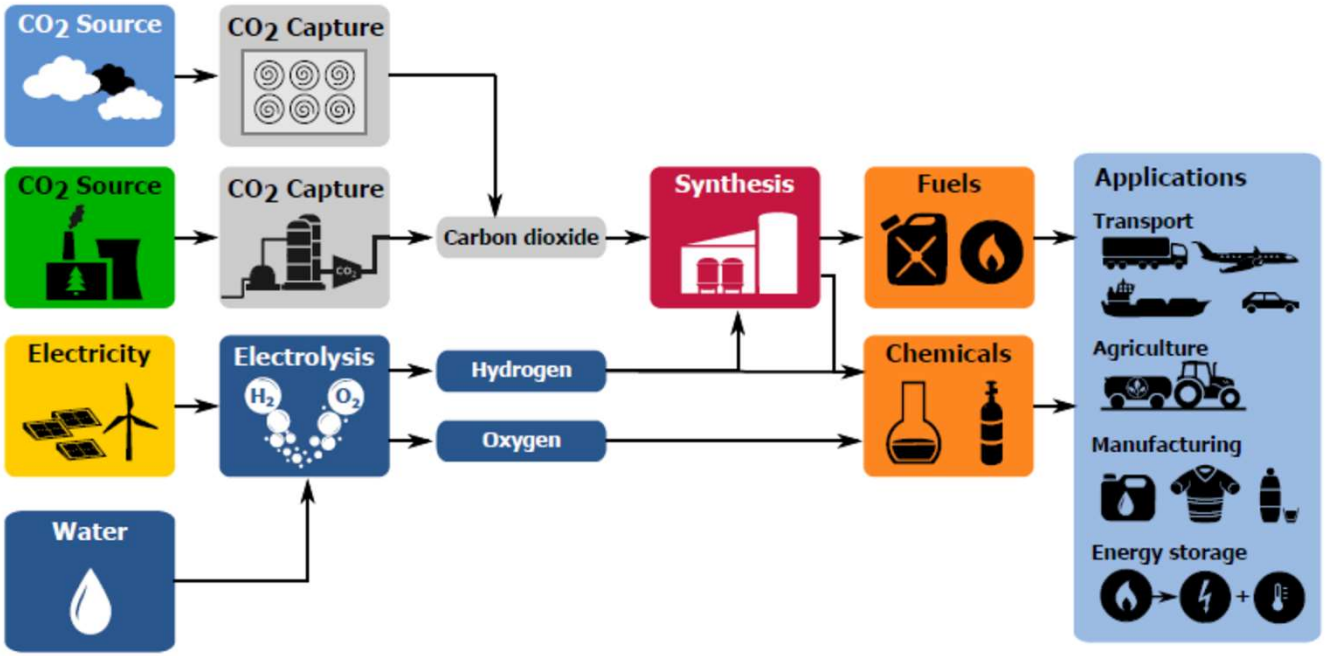


Solar economy

Hydrogen economy



What is Power-to-X Economy?



H_2 and CO_2 are used for the production of synthetic fuels (electrofuels, e-fuels) and chemicals using renewable electricity

Power-to-X:

- Direct electrification
- Electricity storage
- Power-to-mobility
- Power-to-heat
- Power-to-gas (H_2,CH_4)
- Power-to-liquid (MeOH, FT, NH_3)
- Power-to-materials (steel, aluminium, carbon fibres, etc.)
- Power-to-fresh water
- Power-to-CO_2
- Power-to-food
- Power-to-forests

Our Research Focus

- Market and business models
- Renewable energy resources, production and conversion technologies
- Energy efficiency
- Energy storage
- Demand response
- Regulatory functions
- Mitigation of climate change
- Techno-economic modelling of integrated energy systems
- Consideration of the social, political, economic, and environmental landscape to which we all belong

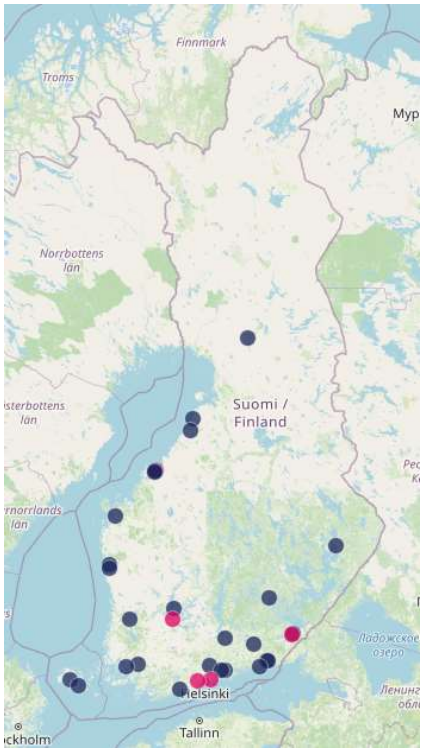
Courses for Renewable Power-to-X Economy

Obligatory specialization studies (64 cr)		*Year*	*per.*	*cr*
BL20A1300	Energy Resources	DI 1	1-2	6
BL20A1400	Renewable Energy Technology	DI 1	3-4	6
BL40A2401	Electrical Engineering in Wind and Solar Systems	DI 1	3-4	6
BL40A3021	Technologies for Electrochemical Energy Conversion and Storage of Electricity	DI 1	3-4	5
BL20A1500	Energy Scenarios	DI 2	1-2	6
BH61A0700	Energy markets	DI 1	1	5
BL10A2001	Master's Thesis	DI 2	3-4	30

Elective specialization studies, min 5 op		*Year*	*per.*	*cr*
BL20A0601	Electrical Power Transmission		2	5
BL30A1301	Advanced Power Electronics	DI 1	3-4	6
BL30A1321	Modelling and Control of Power electronic Converters	DI 1	3-4	5
BL301040	Electrical Drives 1	DI 2	1	4
BL40A1101	Embedded System Programming		1-2	5
BL40A0510	Digital Control 1	DI 1	1-2	4

What Can You Do After Graduation

- Research and education
- Government and NGOs
- Transmission, distribution and retail companies
- Energy market authorities and regulators
- Companies and industry need energy experts that understand ’the big picture’, including future trends
- Technological research, development, sales and support
- Renewable energy development companies
- Energy storage and hydrogen offer several possibilities
- Aggregation for demand response and V2G
- Start-up and grassroots organizations



H2 projects in Finland

Further Information

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