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SWISS APPROACH BEYOND FOSSIL FUELS: SECTOR COUPLING WITH DISTRICT HEATING Strategic Role of Biomass

Integrated Energy Systems:

Hydropower • District Heating • Biomass • Storage • Hydrogen

Peter Heusser

SVUT

peter.heusser@svut.ch



FROM ISOLATED SECTORS TO SECTOR COUPLING

CURRENT SYSTEM

Separated Infrastructure



ADVANCED NETWORK

Sector Coupling

- Electricity
- Heat
- Mobility
- Gas

Electricity ↔ Heat ↔ Storage
↔ Hydrogen ↔ Mobility
↔ Biomass
↔ Waste-to-Energy



Evolution of Swiss and Serbian Energy Policy

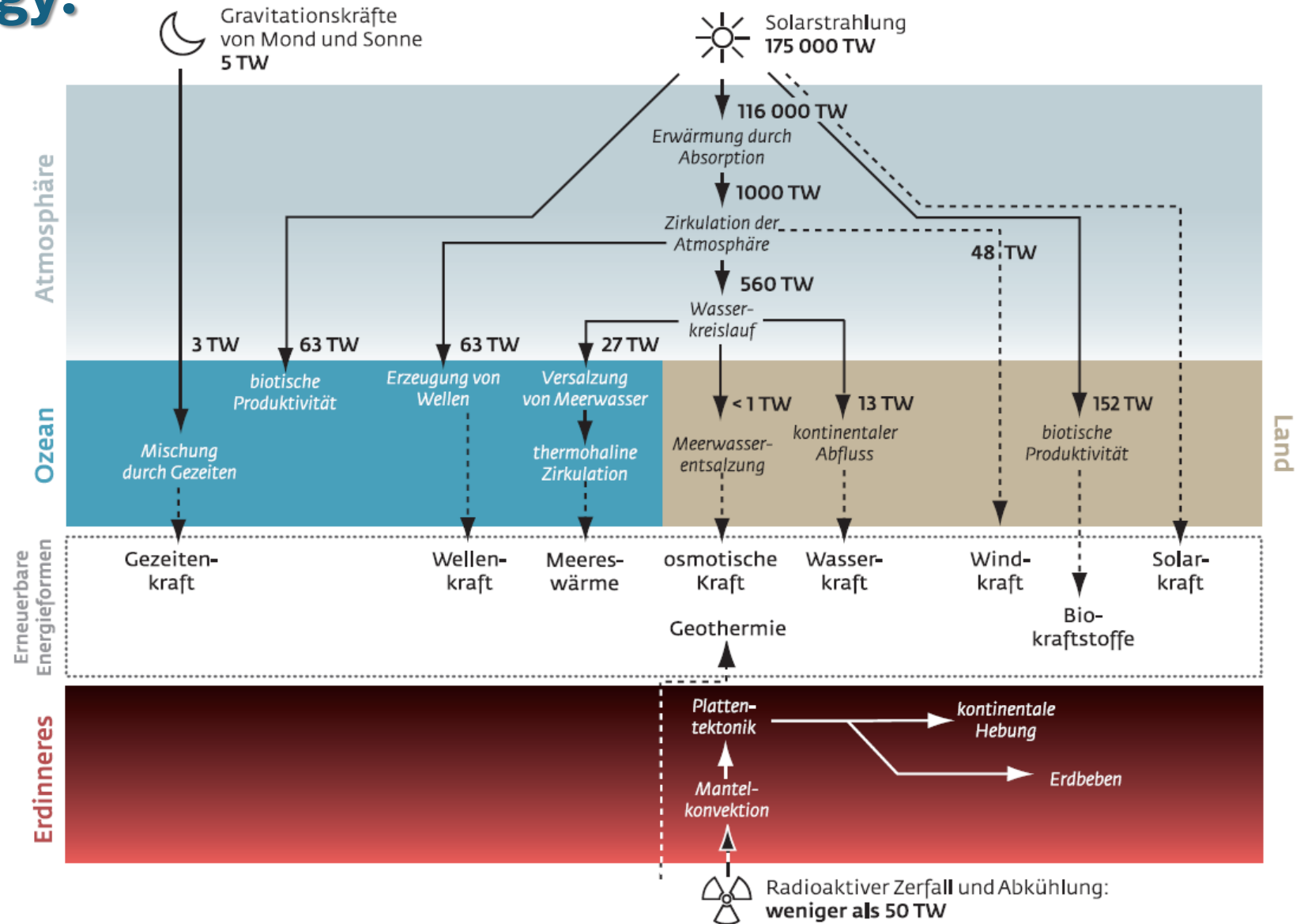
Periode	Switzerland	Serbia
1900–1960	Hydropower expansion First Waste-to-Energy plants (1904)	Initial electrification Early thermal power
1948–1980	Nuclear expansion Beznau I 1969 Leibstadt 1984	Lignite power plants District heating systems
1960 – 1980	Low-carbon electricity system	Large hydropower projects Đerdap / Iron Gate
1980 – 1990	Environmental protection laws Swiss Environmental Protection Act introduced (1983) Air Pollution Control Ordinance (LRV) implemented (1985)	Environmental governance emerges during industrial expansion Based on decentralized Yugoslav Constitution (1974) Serbian Law on Environmental Protection (1991)
2000–2014	CO ₂ Act Energy Strategy discussions	Energy market reform Energy Law (2004), Energy Community Treaty (2005/06), EU market integration
2017 – today	Energy Strategy 2050 Climate & Innovation Act (2023)	Renewable Energy Law (2021), INECP, EU climate alignment
Future	Sector coupling optimization	Infrastructure modernization & integrated decarbonization



Renewable Energy:

Reference value:
2000 W / capita
-> 17 TW / mankind

Possible ways to use
renewable energy



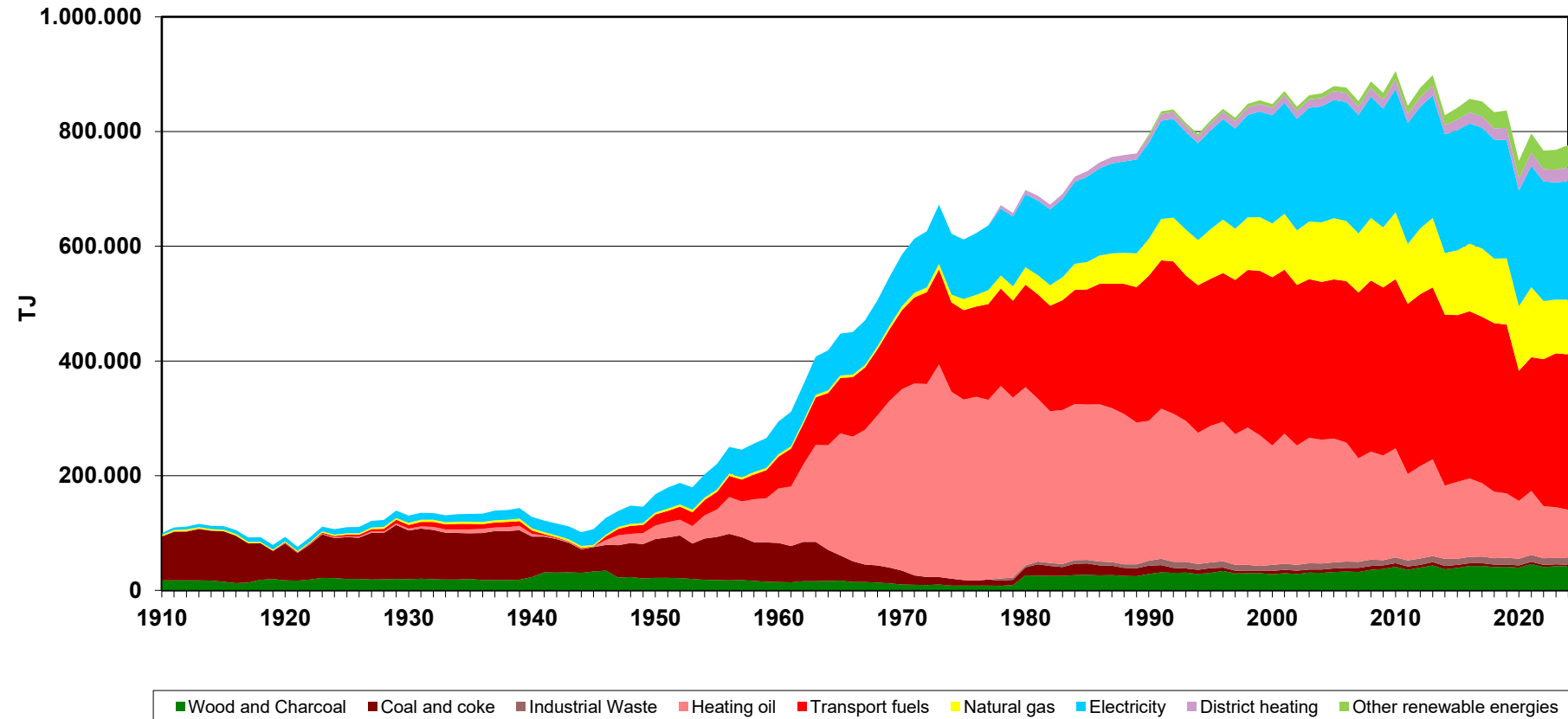
Swiss Energy System Today:

Energy consumption in Switzerland

Energyconsumption 1910-2024 by Source

Electricity production today:

- Hydropower ~56–60%
- Nuclear ~27–31%
- Solar PV ~8–10%
- Biomass + WtE ~3–4%
- Wind ~0.2–0.5%
- Fossil thermal / others ~1–2%



Quelle: Schweizerische Gesamtenergiestatistik 2024,
BFE



Biomass – Storage of Solar Energy

Technology	Availability at Winter	Dispatchable
Solar PV	Low	No
Wind	Variable	No
Biomass	High	Yes
Waste-to-Energy	High	Yes

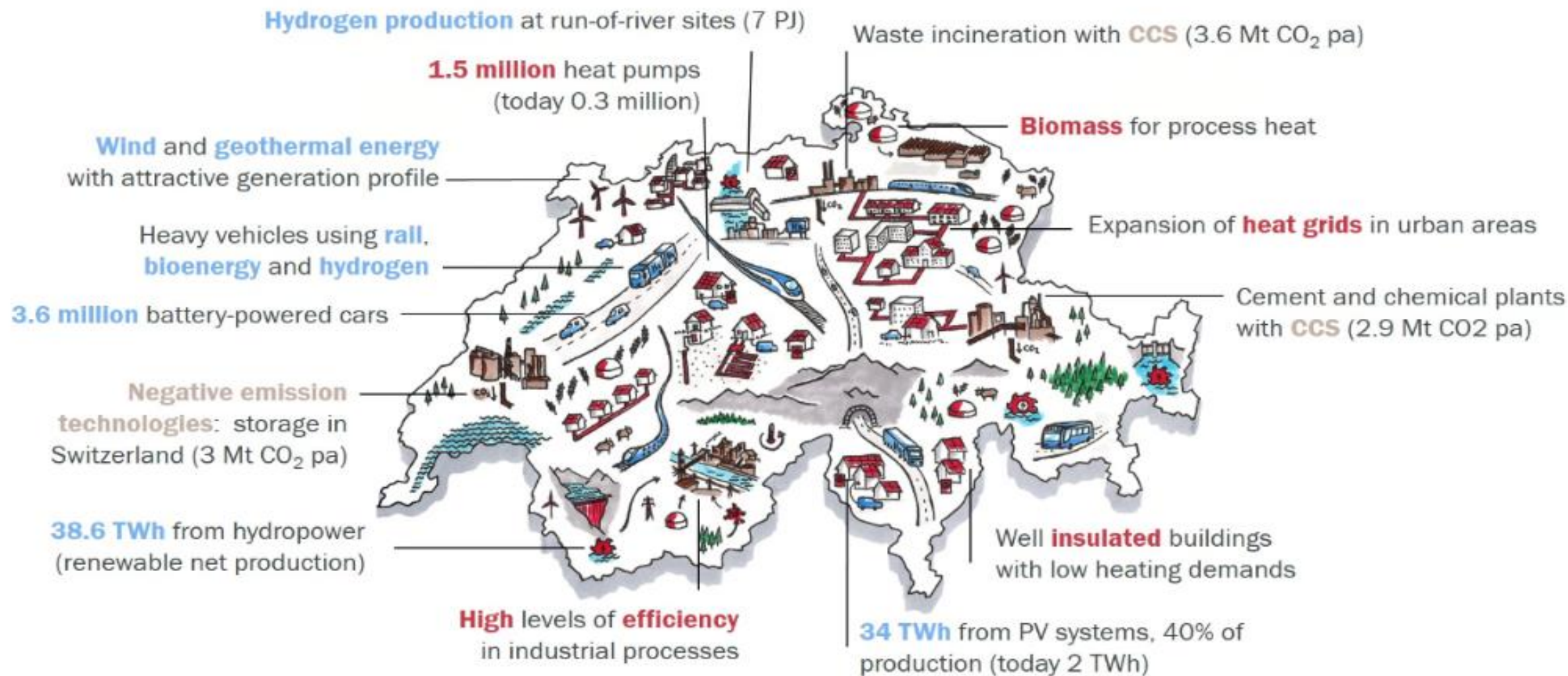


Switzerland vs Serbia — Total Energy Systems

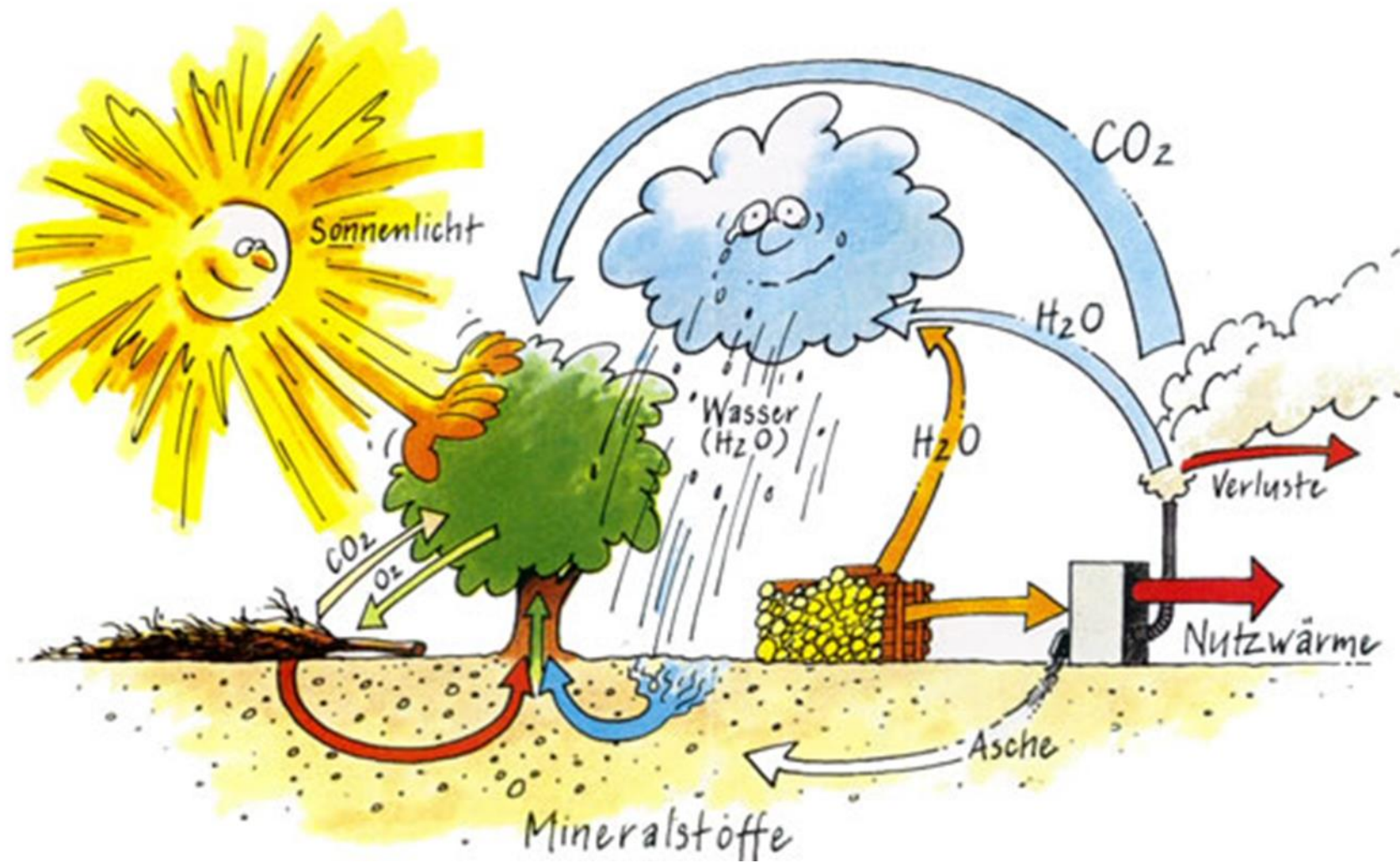
	Switzerland		Serbia	
Electricity:	• Hydropower • Nuclear	Low carb	• Lignite / coal • Hydropower	
Heat & Mobility:	• Oil products • Natural gas		• Oil products • Coal • Natural gas	
Emerging integration:	• District heating • Biomass • Waste-to-Energy • Heat pumps		• Renewables • District heating • Biomass	
Main challenge:	Sector integration & winter flexibility		System modernization & decarbonization	



Objectives for a climate-neutral Switzerland by 2050



Graphics: Dina Tschumi; Prognos AG



Podaci o autoru:

Dr. Peter Heusser
Co-President
SVUT
Peter.Heusser@svut.ch

Hvala na pažnji!
Thank you for your attention!

