Wood, Coal, Oil

A Historical Look at Energy Consumption in Europe and America, 1800-2000

Previous „Frontiers in Energy Research“ Topics

- Source: http://www.esc.ethz.ch/events/frontiers-in-energy-research/previous-presentations.html#SpringSemester2018.

For What Purpose Do You Study Energy?

Learning Objectives of Today's Lecture

- Identify the goals, approaches, research fields and methods of historical energy research.
- Name the main research fields of historical energy research and their core problems.
- Describe the main historical energy transitions.
- Trace the particularities of transition in the use of energy resources from wood to coal and oil.
- Compare the developments of this transition in different countries.

Energy

- **ἐνέργεια** = activity, operation. **vis viva** = living force.
- **Physical quantity:** kinetic, potential, electric, magnetic, chemical, radiant, thermal etc.
- “Energy Is Not the Ability to Do Work“ (Robert Lehrman):

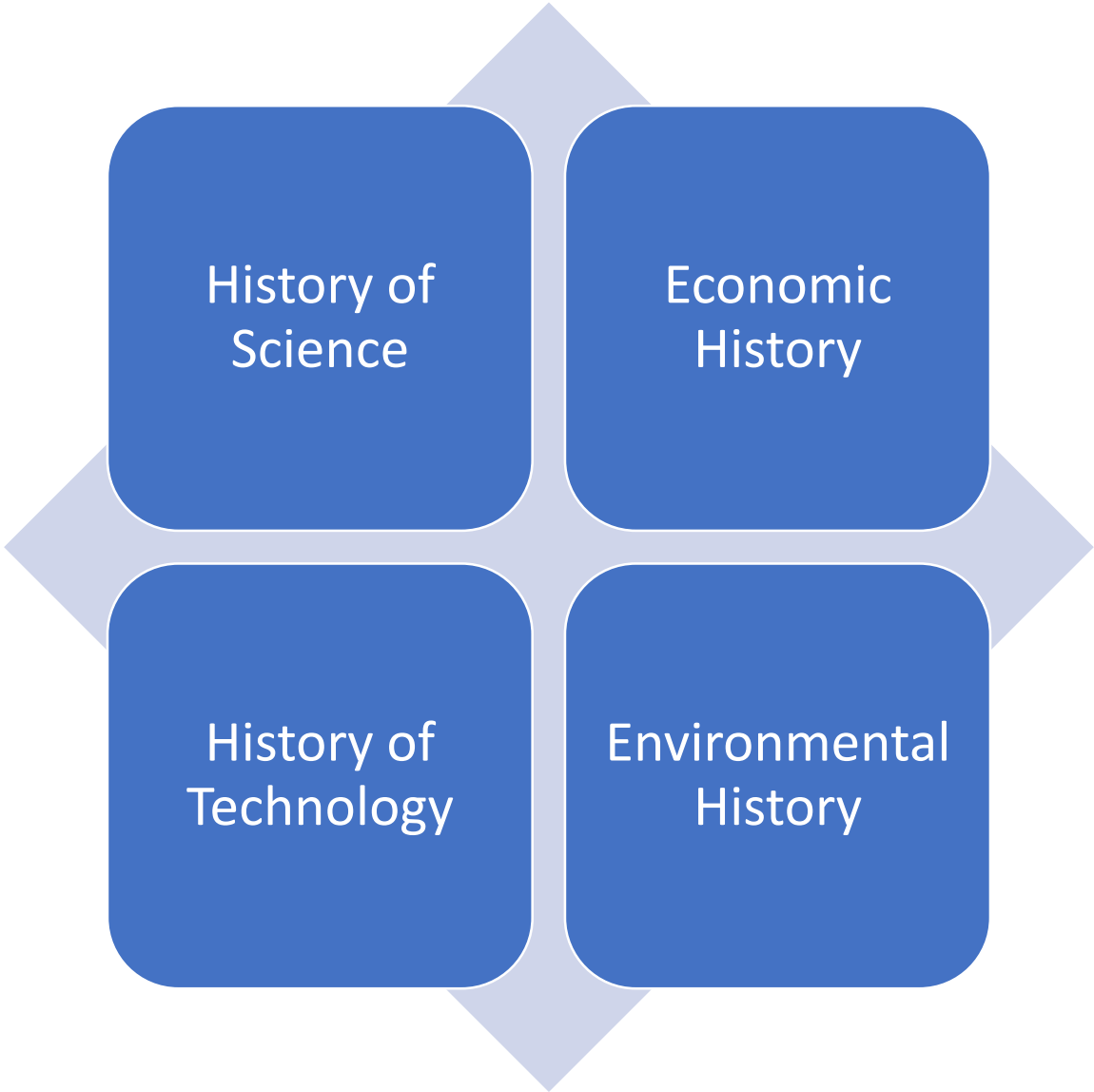
“The formulas are human inventions”.

- Juxstapposition of various concepts of energy.

mgh hc/λ

$mv^2/2$ $cm\Delta T$ $3kT/2$

Historical Energy Research



Economic History

Sugiyama, S. (Ed.): Economic History of Energy and Environment (2015):

- Deforestation, industry and energy consumption.
- Transition from wood to coal.
- Energy, ecology and environment.
- British Smoke Nuisance Abatement Act of 1821.

Source: https://www.springer.com/de/book/9784431555063

History of Science and Technology

Madureira, Nuno Luís: Key Concepts in Energy (2014):

Energy has a history

- Influence of energy on the course of history.
- Hybridization of (energy) technologies.
- Complex entanglements.
- Energy transitions.

Source: https://www.springer.com/la/book/9783319049779

Environmental History

McNeil, J.: Something New under the Sun. An Environmental History of the Twentieth Century (2001):

- Global ecological distruction.
- Energy shifts in industries.
- Acceleration in energy use.
- Energy history of empires.

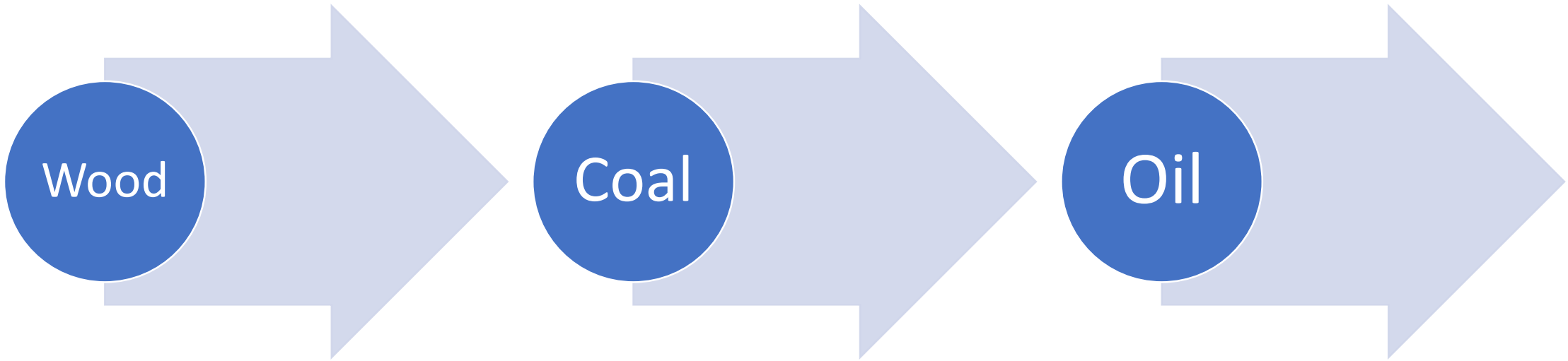
Source: https://books.google.at/books/about/Something_New_Under_the_Sun.html?id=XqjCQgAACAAJ&source=kp_cover&redir_esc=y

Core Questions

- To what extent do economic factors influence the development of energy and technology?
- What role does energy play in the establishment and reproduction of global inequality?
- What were/are the circumstances of energy transitions?
- Which technical and infrastructural changes were caused by the changing ways of dealing with energy over time?
- How did energy change working practices and housekeeping?
- In which relation do energy and environment stand to one another?

Historical Energy Transitions

Prices



Speed

Social values

Energy Regime

- Stable social configurations of energy production, distribution and consumption.
- Material components of energy regimes:
- Energy regimes are closely connected to certain key energy resources, specific technologies, and infrastructures.
- Immaterial components:
- Social implications, values and institutionalized norms related to material components of energy regimes.
- Source: Kupper/Pallua 2016: 9.

Six Energy Regimes

- **1800:** Beginning industrialization by means of traditional energy resources: muscular strength, water power, and wood.
- **After 1860:** The increasing use of coal. Transition to non-renewable energies.
- **1900:** Electricity.
- **1960:** Oil (since 1920 in Europe, massively since 1960).
- **1945:** Nuclear energy.
- **1970:** Discussions about alternative energy resources, energy efficiency etc. At the same time the continuous dominance of oil and nuclear energy. Source: Kupper/Pallua 2016: pp. 9-10.

Conclusions

- Non-simultaneity of energy transitions over the world.
- Complex entanglements between economic, social, political and cultural factors of energy transitions.
- The users of energy gain in importance.
- Energy transitions influence material cultures of heating, lighting, cooking etc.
- The values inscribed in energy systems profoundly shape our (historical) narratives.
- The power of the discourse should be discussed critically regarding the continuous dominance of nuclear energy and oil despite the debates about renewable energy.

References

- Fouquet, Roger. Historical energy transitions: Speed, prices and system transformation. In:Energy Research & Social Science 22 (2016) 7–12.
- Gismondi, Michael. Historicizing transitions: The value of historical theory to energy transition research. In: Energy Research & Social Science (2018) 38, pp. 193-198.
- Kupper, Patrick / Pallua, Irene. Energieregime in der Schweiz seit 1800. Bern 2016.
- Madureira, Nuno Luis. Oil in the age of steam. In: Journal of Global History (2010) 5, pp. 75–94.