

Model of a Sustainable Energy Concept for Austria

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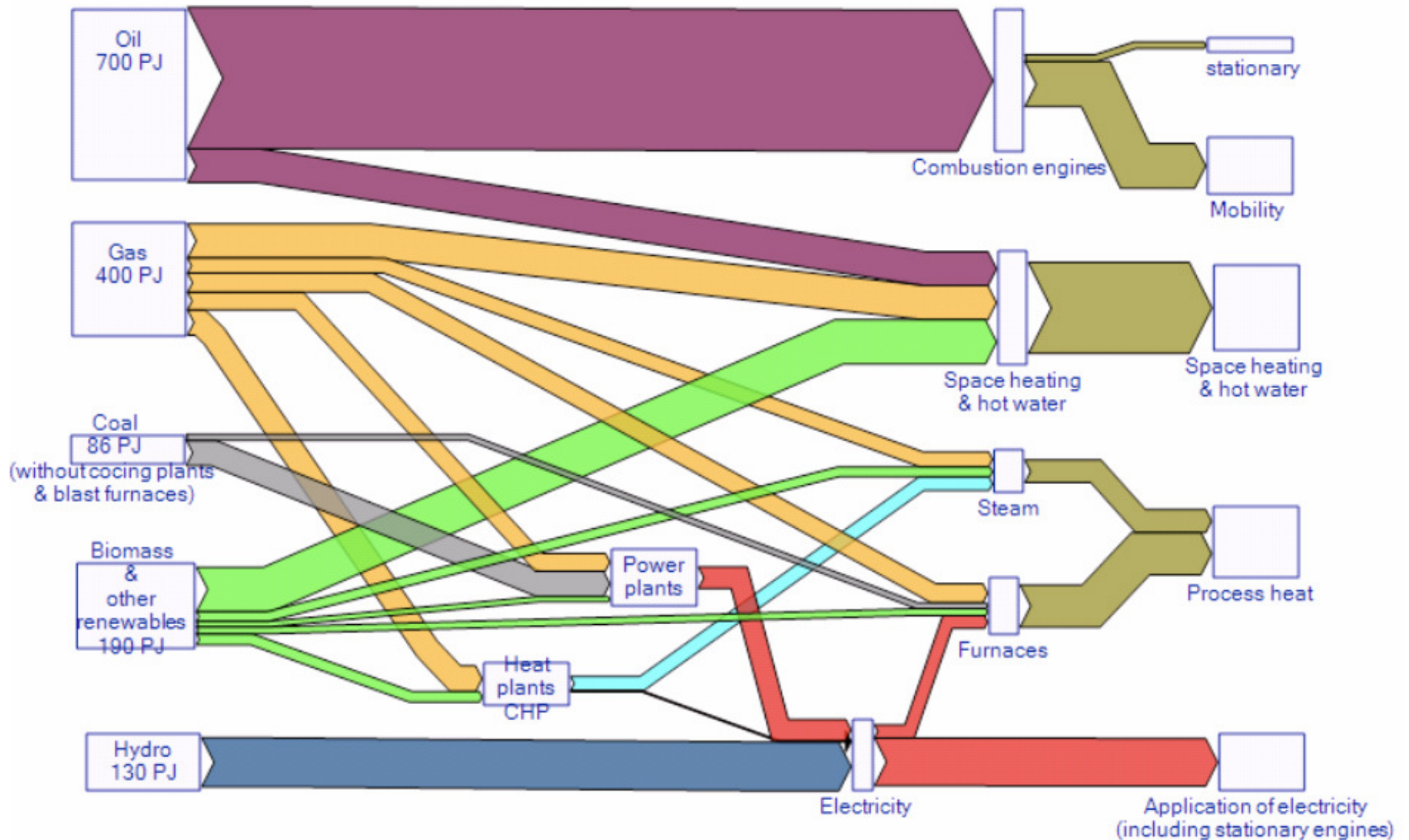
Work conducted in course of the project
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Traffic, Innovation and Technology, coordinated by
Umweltmanagement Austria.

Background

Our present public economy is based on the use of **fossil** energy carriers and **mineral** and **metal** resources.

Renewable resources are a distinct, but minor part

Energy Provision in Austria 2005



only fundamental flows displayed, small flows neglected

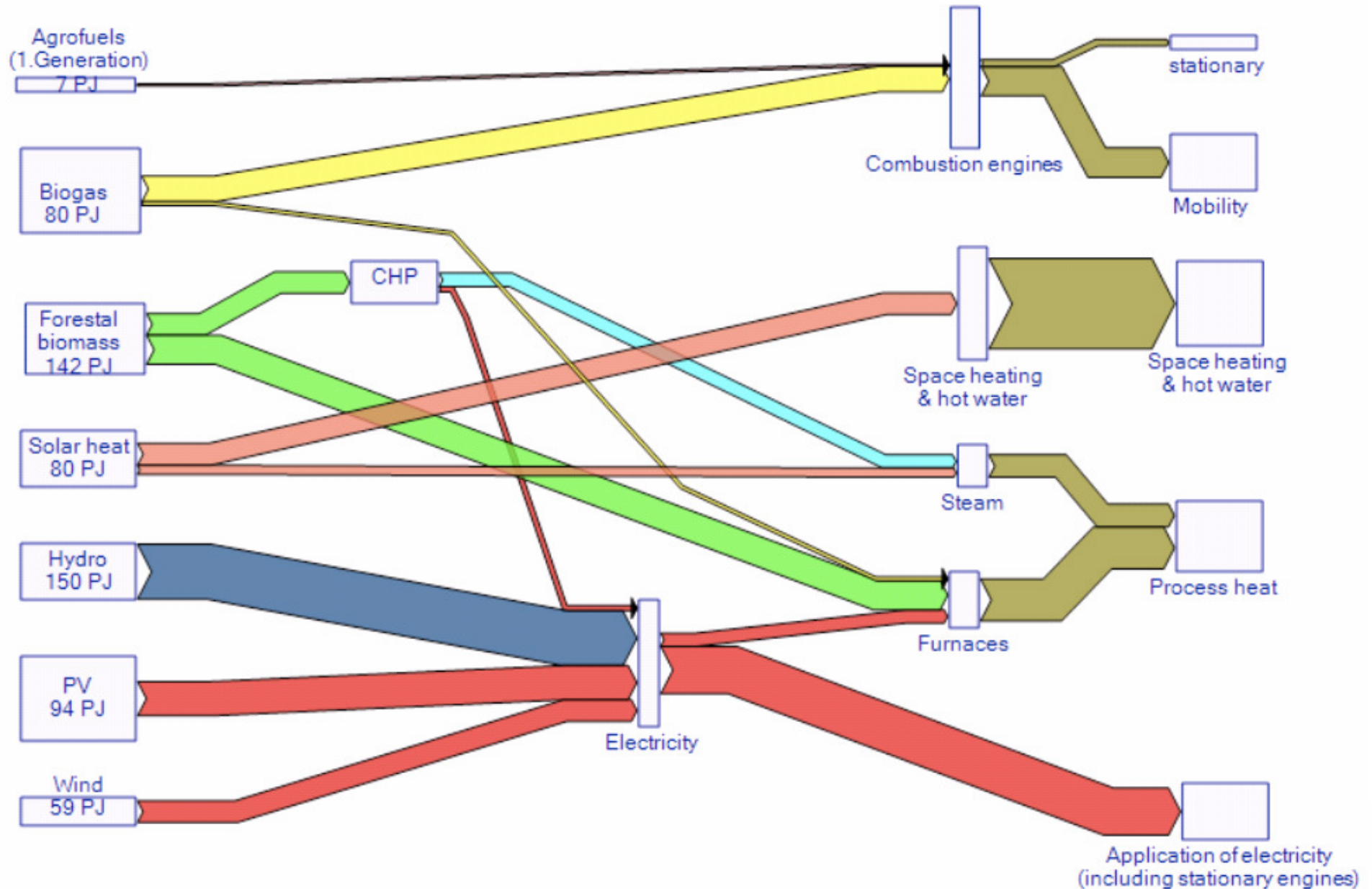
Objectives

- **Cornerstones for a sustainable energy supply in an sustainable society**
- A Sustainable Energy and Economic System is solar based und uses primarily renewable resources
- High energy and resource efficiency needed
 - Minimization of energy-use
 - Optimized provision technologies
 - High total efficiency (degree of utilization)
CHP, Cascading of energy and material use

Renewable Potentials

- Solar based Energy
 - Water Power, Photovoltaic, Wind Energy
 - Solar collectors for water and space heating
- Biomass Use in Industry
 - CHP for process heat (!!)
 - Industrial furnaces (technological feasibility??)
- Biofuels
 - Biogas, Biodiesel, Ethanol

Solar und biogen Potentials



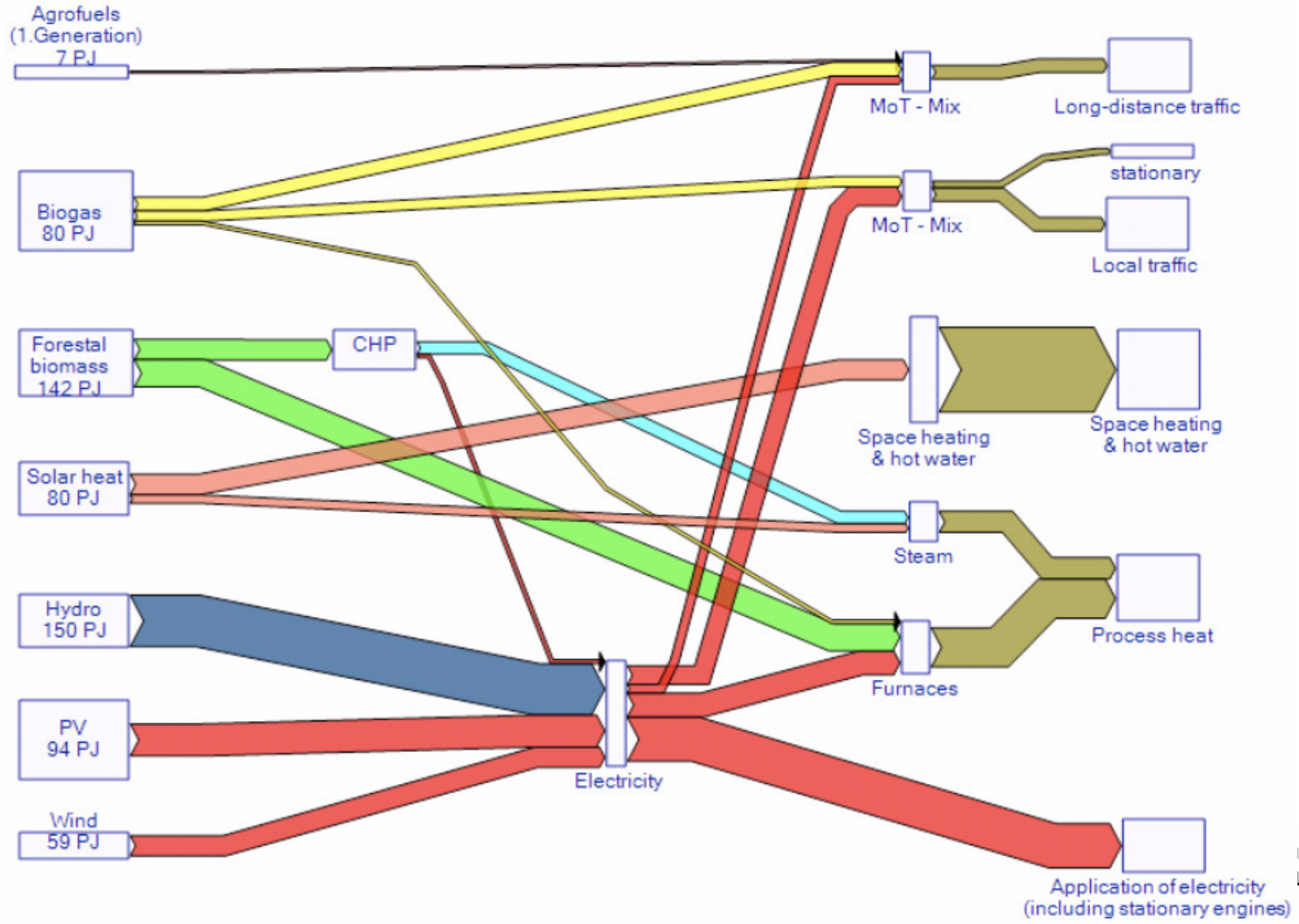
Solar und biogen Potentials - Conclusion

- High magnitude of **Solar and Water based energy**
- **No Coverage of actual energy demand possible**
- ➔ Change in energy demand structure unavoidable
 - Thermal insulation reduces space heating demand
 - Switch in Modal Split in traffic
 - Enforcing biomass use in industry
 - Industrial waste heat for space heating in densely populated areas

Switch in Modal Split

- High efficiency of electric motors
-> enforcing electro mobility
- < 1 km distance: walk, bicycle
- Up to 20 and 50 km: El-bicycle, El-scooter, Metro, Train, Tram/Bus
- > 50 km: Public transport, Hybrid, Biofuel, Biogas
- Transport of goods: Train, supplemented by Biogas, other Biofuels

Results of changed Modal Split

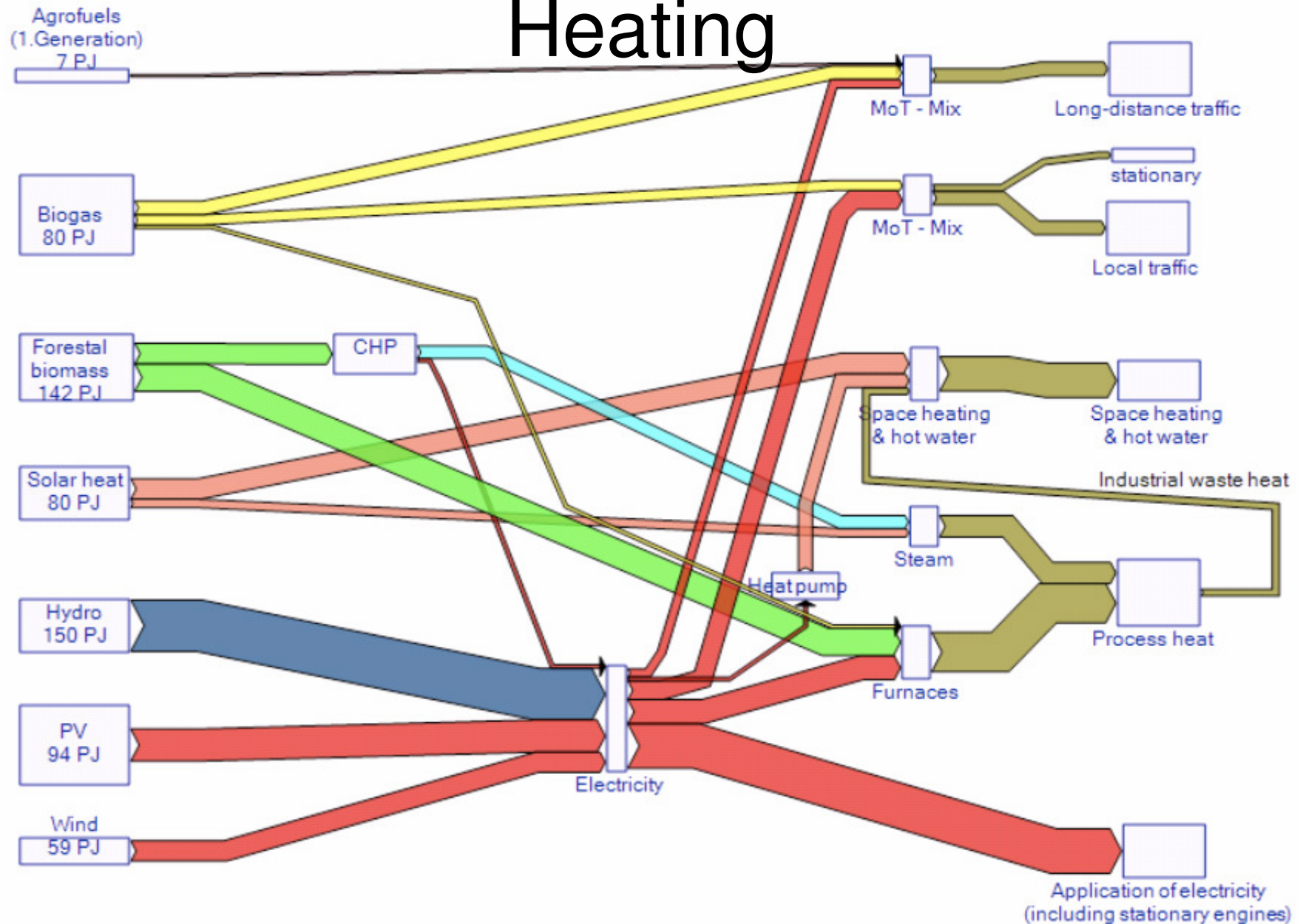


Demand Structure Switch

– Space Heating

- Improved thermal performance of buildings:
Heating demand => 50 kWh/m².a
- Solar heat for water and space heating in rural regions
- Heat pump for LT-Heating systems
- Cascaded use of heat – waste heat use
 - Utilisation of waste heat in urban areas
 - Industry-Commune Cooperations for district heating in rural regions

Results after switch in Space Heating



Resumee

- Coverage of energy demand possible for Austria
- **but** with structural changes and different technologies
 - Structural changes in traffic
 - Increased building performance
 - Industri waste heat use in regional cooperations
 - Local solar based networks in rural regions
 - Different grid management