Back to the Present: Changing the Future Today
Roadmap to a decarbonised energy system in Vienna

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Austria's leading energy provider

- Electricity, gas, heat and cold supplier for 2,000,000 people
- Investments of 870 million Euro until 2022
- 830 charging stations in the metropolitan area of Vienna
- Austria's largest solar energy producer
- 1 million calls per year on the service hotline
- Our power plants stabilise the grid nearly 200 times a year
- First real gas deal with blockchain
- District heating for 6,800 key accounts
- 32 civic power plants
- District heating for 380,000 households
- More than 2,500 employees
- Energy gained from 900,000 tonnes of waste
Energy Transition = Electricity Transition + Heat Transition

<table>
<thead>
<tr>
<th>Energy transition</th>
<th>Vienna (2015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>electricity</td>
<td>~8 TWh</td>
</tr>
<tr>
<td>+</td>
<td></td>
</tr>
<tr>
<td>heat</td>
<td>~15 TWh</td>
</tr>
<tr>
<td>+</td>
<td></td>
</tr>
<tr>
<td>mobility</td>
<td>~13 TWh</td>
</tr>
</tbody>
</table>

Share of renewable energy

- Electricity: 63%
- Heat: 13%
- Mobility: 8%

The Heating Market Needs Fundamental Changes By 2050

![Image](source:swm.de)

Source: swm.de

Source: energieleben.at

Source: Vienna Energy

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* 10% others (industrial waste heat, biomass, CHP, thermal power station) in 2050

*Geothermal power 36% in 2050*

*Waste incineration plants 35% in 2050*

*Large heat pumps 19% in 2050*
For A Successful Integration Of A High Renewable Share: Two Examples Of Sector Coupling

Power

53 GWh

Large heat pump

98 GWh

Heat gained from cooling water and water of the Danube canal

151 GWh

District heating system

Surplus power

District heating system

Central Europe’s largest heat pump at Simmering

Power-to-heat station at Leopoldau

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• Flexible CHP’s will be the centerpiece of the system

• Decarbonisation of the energy system - production of power and heat with wind, pv, biogenic substances, ...

• Sector coupling enables an efficient way between the energy sources and services

Sector Coupling Changes The Game
Vienna Energy Research Project „waste-to-value“ ...

... researches the production conditions for green gas and liquid fuels!

Green gas will be an essential building block for future energy systems!

- Electricity
  - Electrolysis
  - Methanation
- CO2
  - Gasification
- Biomass
  - Fischer-Tropsch synthesis
- Sewage sludge
  - Green crude
  - Waste heat
  - Green gas

- „Waste-to-value“ is a pilot project for industrial upscaling
- From „waste-to-energy“ (heat, cold, electricity)
  to „waste-to-value“ (gas, fuels, chemical resources)
Transformation Of The District Heating System Is In Progress

Transformation of the district heating system (4th generation)

- Plants to cover the heat demand peaks
- CHP
- Geothermal energy
- Large heat pumps
- Large solar thermal plants
- Seasonal heat reservoirs
- Heat storage
- Industrial waste heat
- Waste incineration plant

Goal 2050

Low-energy house + Renovated old building stocks + Business/industry

- Increasing efficiency of customer systems
- Demand-Side-Management
- Peak-Shaving

- Expansion of renewables in the district heating system
- Seasonal heat Storage
- Geothermal
- Solar thermal
- Large heat pumps

Consumption

Production

Infrastructure

2018 2021 2030

Peak-Shaving

Increasing efficiency of customer systems

Demand-Side-Management
The Decarbonisation Of Vienna Until 2050 Is Difficult But Possible!

What is needed to decarbonise Vienna until 2050?

• A 100% renovated building stock with a heat demand below 50kWh/m²/a

• An expansion and total decarbonisation of the district heating system in densely populated urban areas

• Strong use of decentralised heat pumps and low-temperature networks for the district heating system and individuals.

• Starting in 2025, a large-scale replacement of fossil gas and fuels towards renewable ("green") gas and fuels

• A reduction of motorised individual traffic, an increased use of public transport and bicycles and 100% electric or fuel cell vehicles.

• Considerable investment effort (investment costs of 28 billion € for Vienna from 2017 - 2050)
„I think we’re going to do it, and I think that we must pay what needs to be paid.“

JOHN F. KENNEDY 1962
Thank You For Your Attention!

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