

District Energy in Chile - International Experiences - **Regulatory Framework** Sonderborg

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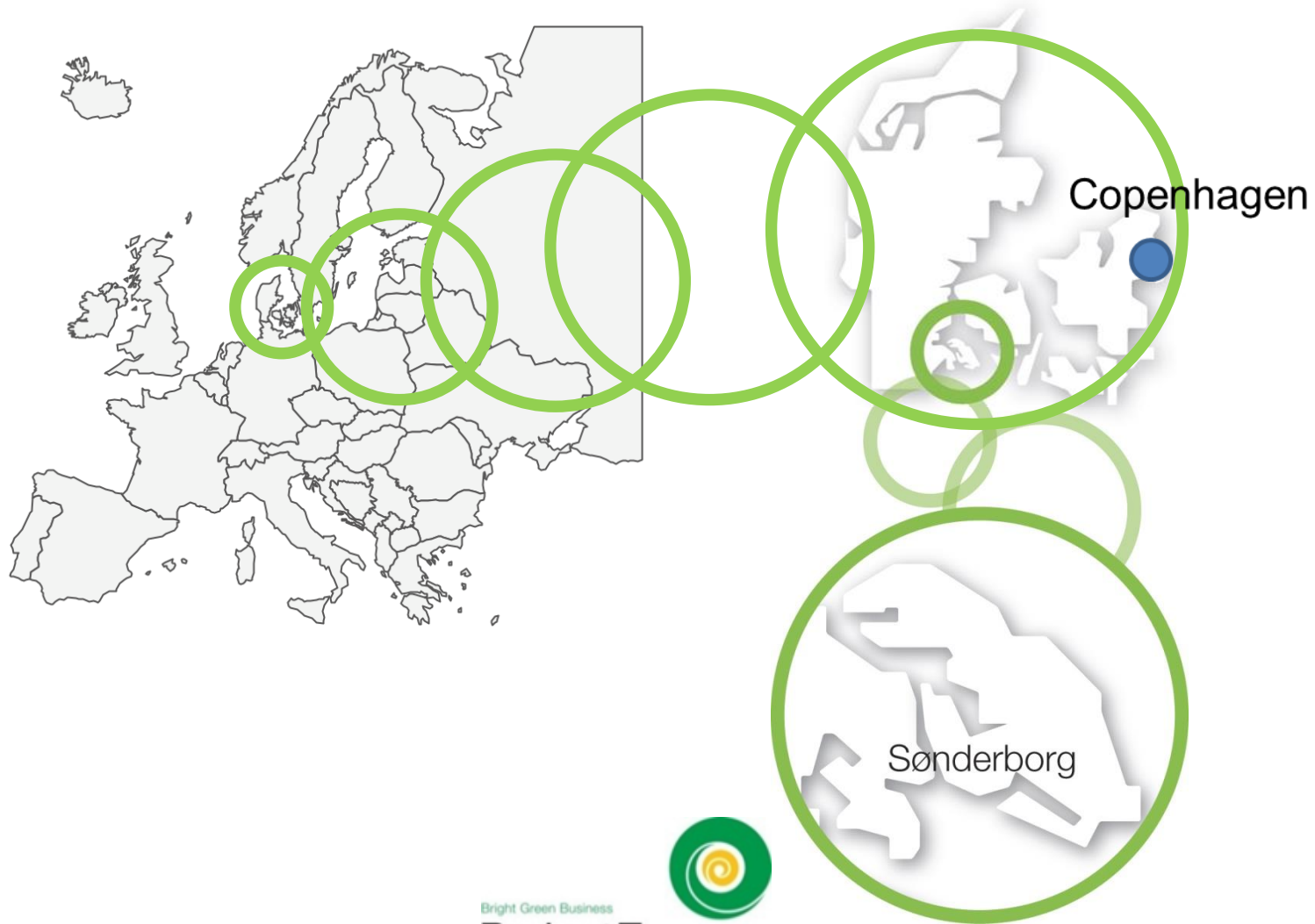


Agenda

- ProjectZero
- Regulatory framework
- Approach combining district heating with retrofitting of existing buildings
- Mix of energy sources



ProjectZero – Where?

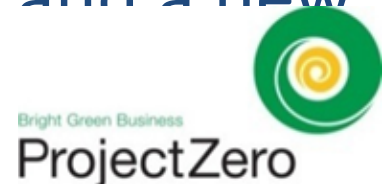


ProjectZero – Why?

ProjectZero is an enabler for Sonderborg to become a **ZEROcarbon community** by 2029, based on

- Sustainable growth and creating new
 - Green jobs
- 20 years ahead of a fossil free Denmark

Our approach is holistic and include Public Private Partnership, technology solutions, business, participation ... and a new thinking!



ProjectZero – How?

#1: Energy efficiency

limit demand for energy
through rational use for
energy



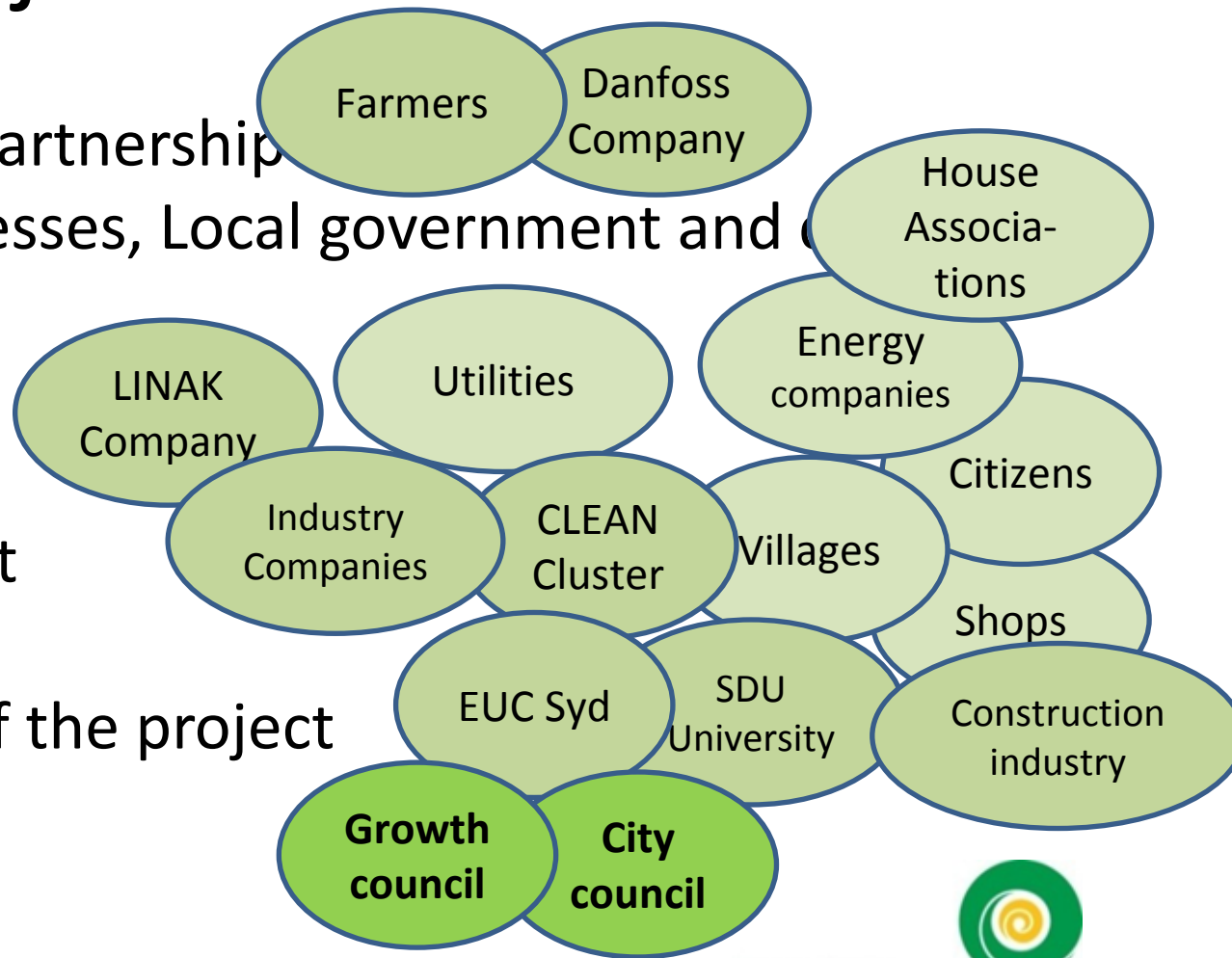
#2: Energy from renewable sources

use renewable energy
to full remaining demand

use fossil fuels, if necessary,
as efficiently and cleanly as possible.

ProjectZero – How?

- Public private partnership
- Major local businesses, Local government and
- Common goal
- Political support
- Local funding of the project
- Catalyst



Major achievements

- **35% CO₂-reduction during 2007 – 2015**

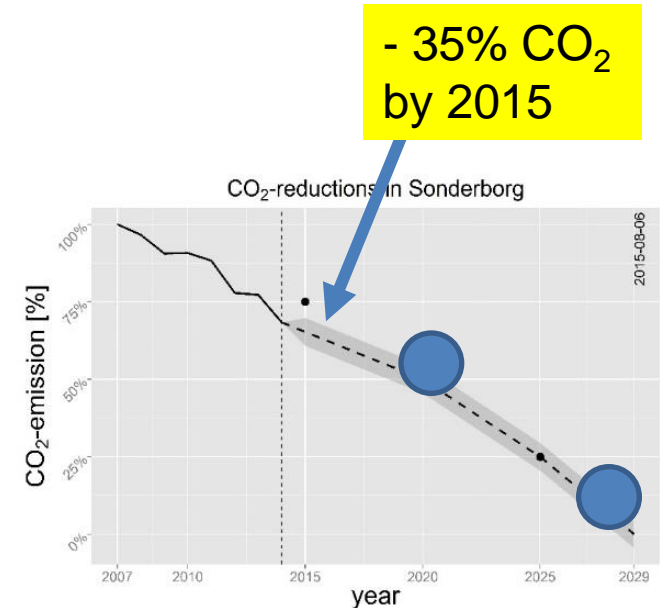
- Overachieved our 2015 milestone (25%)
- Now targeting a 50% reduction by 2020

- **800+ Green Jobs Created**

- In the construction industry
- Green district heating
- Energy consulting

- **A lighthouse beacon for Sonderborg**

- Setting a new direction with future common goals
- Strong community participation
- Enterprises and educations alignment
- Best practice national and international cooperation



Practical approach

- Involvement of stakeholders
- Programs...

ZEROfamily

ZEROhouse

ZEROhome

ZEROshop

ZEROcompany



The ZEROfamily

115 participating families (2009)



Impact

- 25% energy savings
- 45% water savings

The ZERO+ House

Producing more energy than it consumes –
with minimal extra costs



House construction, thermostats, insulation,
installations, green district heating, heat
pumps, appliances, mindset, ..

The ZEROhome

engaging 18,600 homeowners – in retrofit

Concept

- easy, safe and economic viable for owners
- strengthen craftsmanship competencies
- secure financial support
- lean processing across sectors

Impact

- 1,600 homes visited by Charlie
- 65% have initiated retrofit with average €21,000 generating €15 mio in craftsmen sales
- Energy savings up to 45% per household

Mission possible



To get started, requires

- Public Private Participation
- Mayor and City Council commitment
- Local business community interest
- Ambitious goals and a masterplan

To stay successful, requires

- Lead by examples
- Business as a driver
- A green learning city approach
- Progress monitoring and reporting



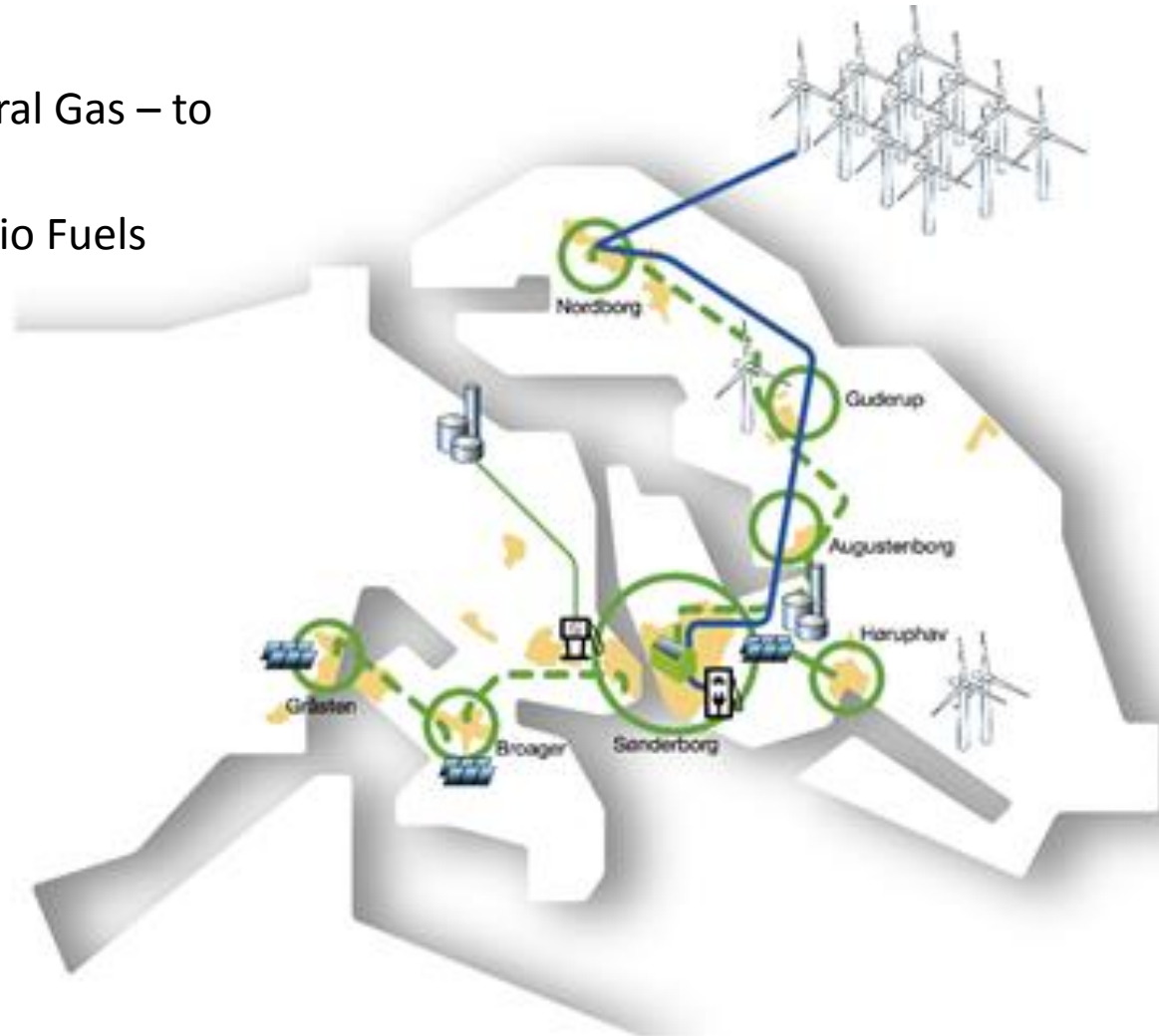
Regulatory framework

- Danish regulatory framework – District heating
 - Fossil free energy by 2050
 - Local regulation of heating source – Energy planning
 - Non profit ownership
 - State controlled pricing – monopoly control
 - State controlled subsidies to energy source
 - Access to cheap funding



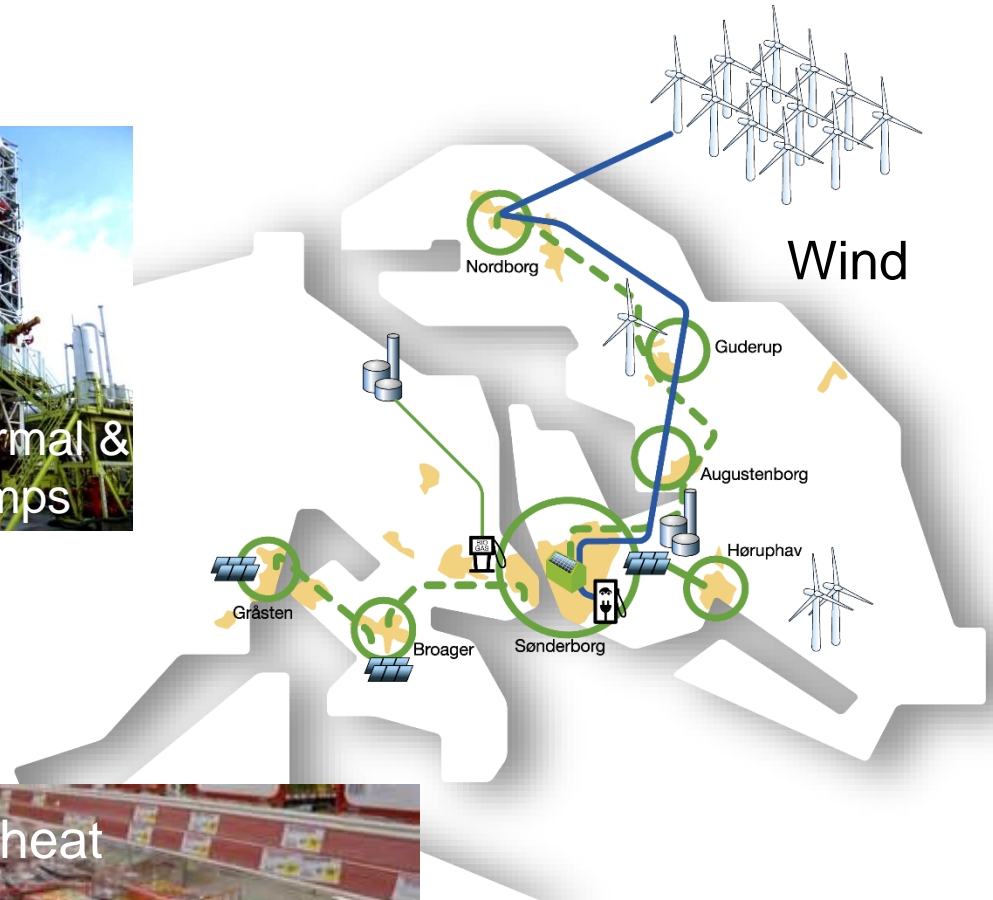
Green District Heating

From oil and Natural Gas – to
Renewables and Bio Fuels



Green District Heating as the heating backbone

With multiple GREENfuel sources





Combined heat and power station – Waste incineration /Gas/steam turbine/Steam



Wood chips fired boilers in combination with heating pumps and geothermal well



Sun Park - Solarpanels



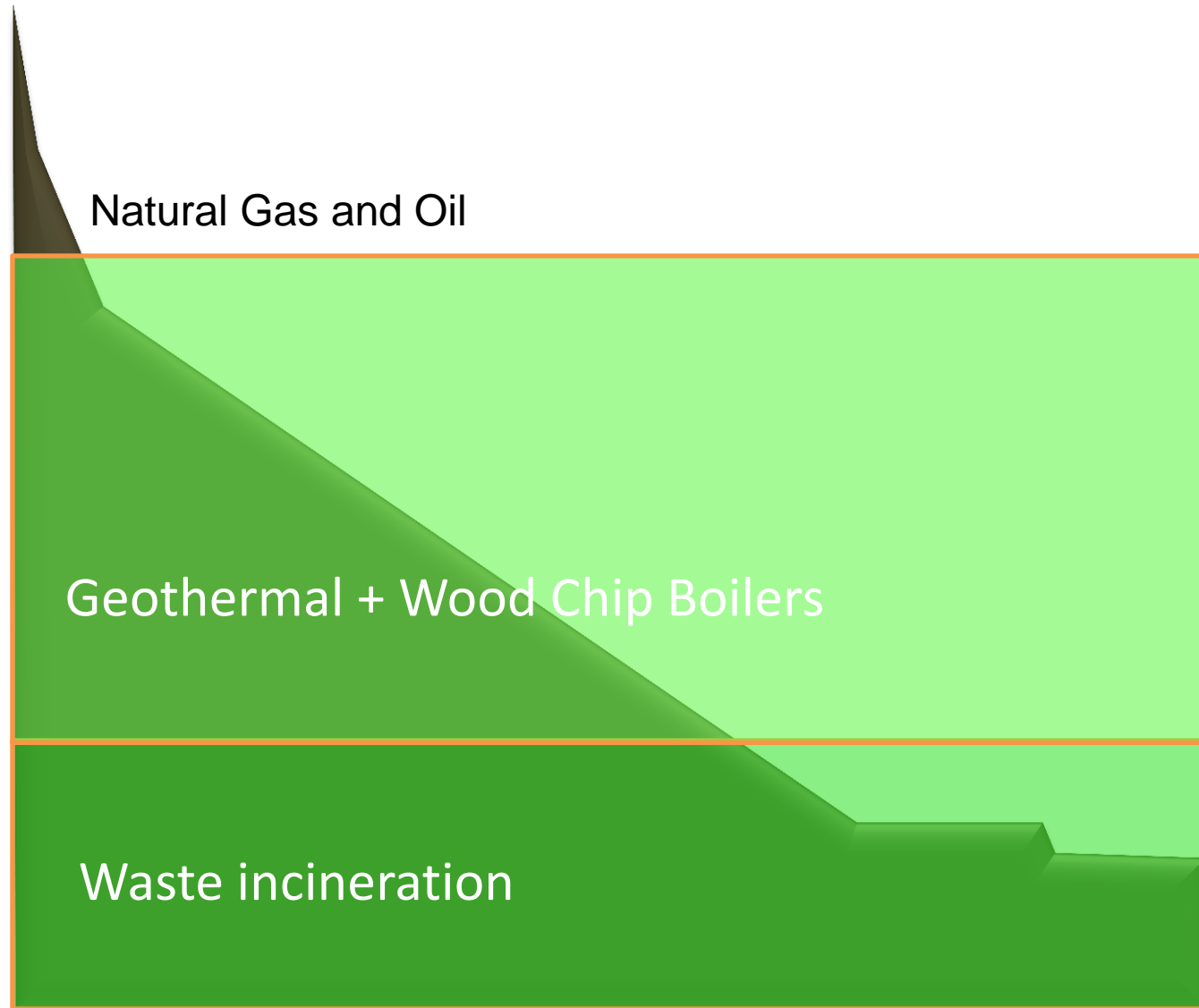
Biomass boiler

The way forward

- Multiple fuel plants
- Increase utilization of plants
 - Increase supply area
 - Increase flexibility of plants
- Focus on customers
 - Private households
 - Industry
 - Buildings with low energy consumption
- Cooperation with other utilities
- Internal processes



Heat demand
MW



8760 h (1 year)

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