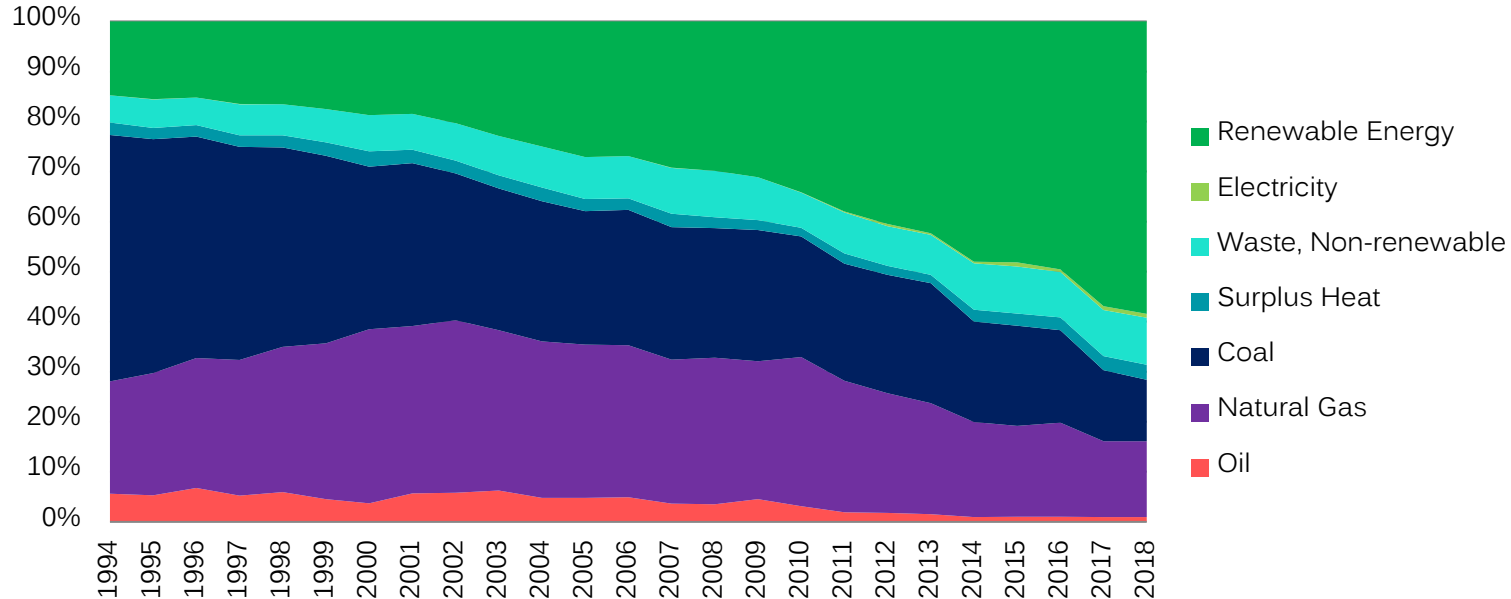


## District heating and renewable energy

Niels Frederik Malskær,  
Danish Energy Agency

# Clean heating transition in Denmark

## FUEL COMPOSITION FOR DISTRICT HEATING, PERCENTAGE OF DISTRIBUTION



Energistatistik, 2018

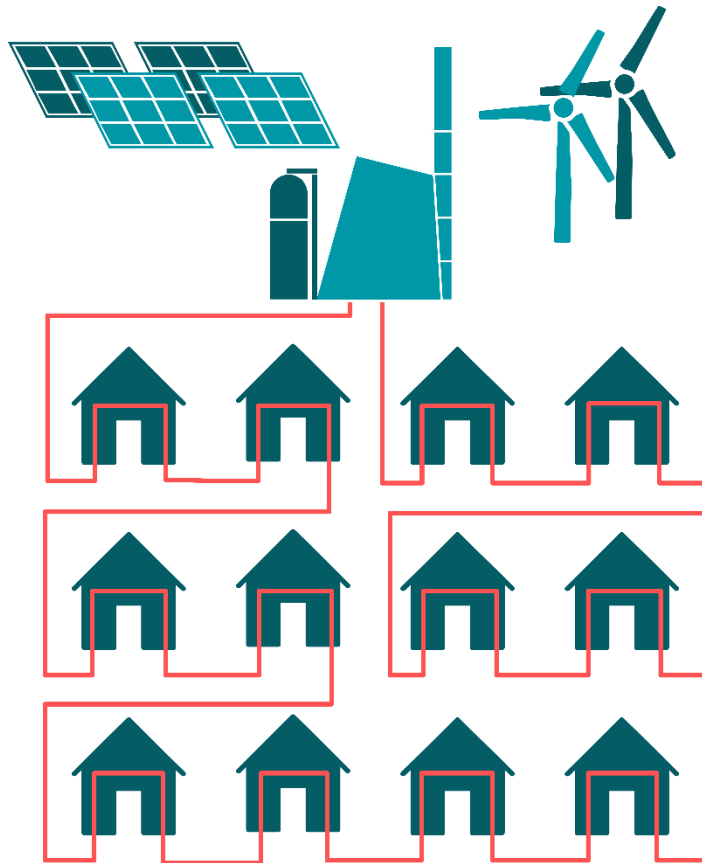
# INDIVIDUAL HEATING

- Minimal governmental intervention
- Cost efficient in some areas
- Hard to convert fuel
- Does not contribute to the rest of the energy system

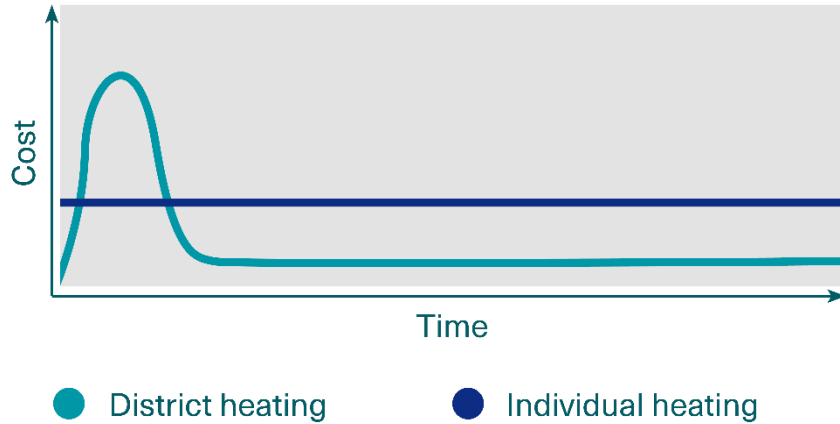


# DISTRICT HEATING

- Low-cost heat
- High security of supply
- Green transition without interfering with homeowners
- Adds flexibility to power generation
- Prerequisite for using many different heat sources

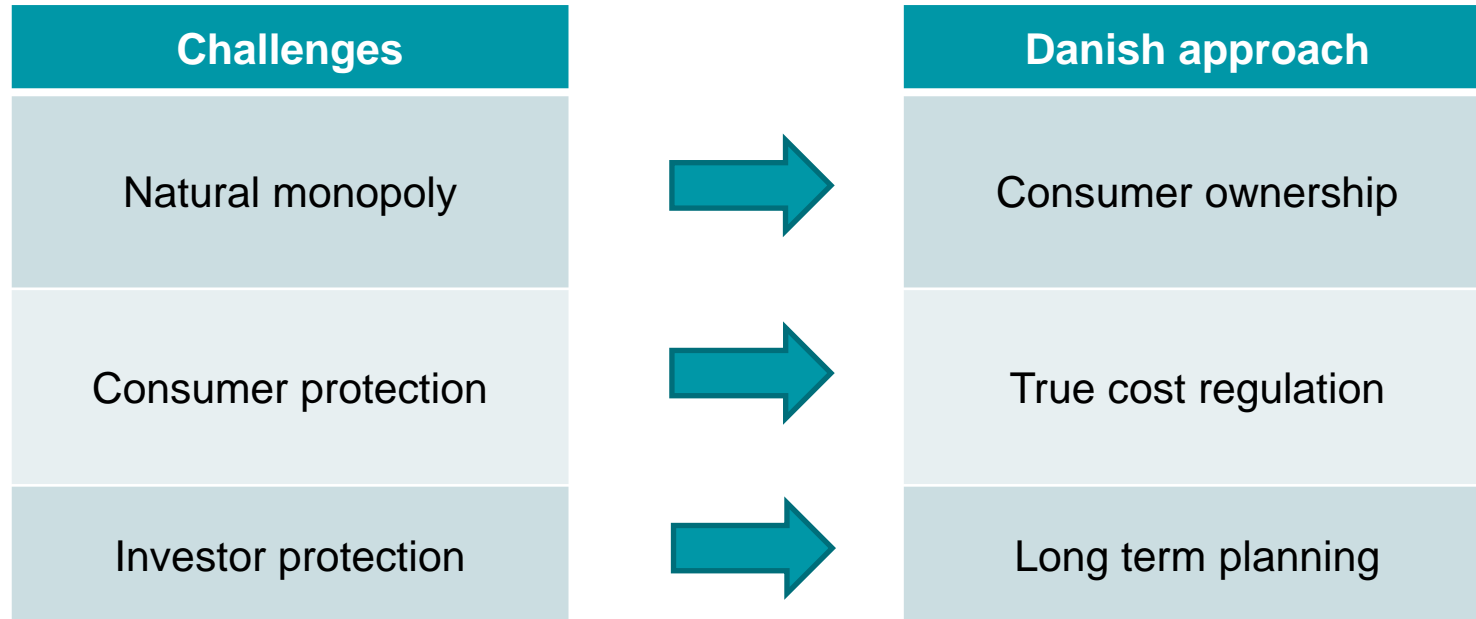


# District heating = Infrastructure



Short term, installing the proper infrastructure for district heating is a **considerable investment**. Over time, the investment pays off.

# Challenges & how Denmark mitigates them



# What Denmark gains from our District Heating approach

The Danish Government has increased the national CO<sub>2</sub>-emission target to 70 % reduction by 2030.

- 100% of energy consumed by the heat sector will be renewable energy by 2035

Focus will likely be on further integration with the wider energy system

- Heat pumps and electric heaters creates valuable synergies with wind and solar pV
- New surplus heat sources like data-centers is a whole new and large potential
- The gas grid is important, but gas is too valuable to be used for heating



An aerial photograph of a densely packed urban area, likely a city center, showing numerous high-rise apartment buildings and commercial structures. The buildings are tightly packed together, with narrow streets visible between them. The lighting suggests it might be late afternoon or early morning, with long shadows cast across the buildings. A large, semi-transparent red circle is overlaid on the bottom right corner of the image, partially obscuring some of the buildings.

## CONSIDERATIONS

- Long term investments
- Solid regulation and planning needed
- Necessary component for energy integration



# What we do at the Danish Energy Agency

SOCIO-  
ECONOMICS



BENEFITS AND CHALLENGES  
FOR THE ENERGY SYSTEM



MUNICIPAL  
PLANNING



REGULATION AND  
HISTORY



INSTITUTIONAL  
ROLES



LESSONS  
LEARNED

