Green transformation of the Polish DHC sector

Chamber of Commerce
Polish District Heating

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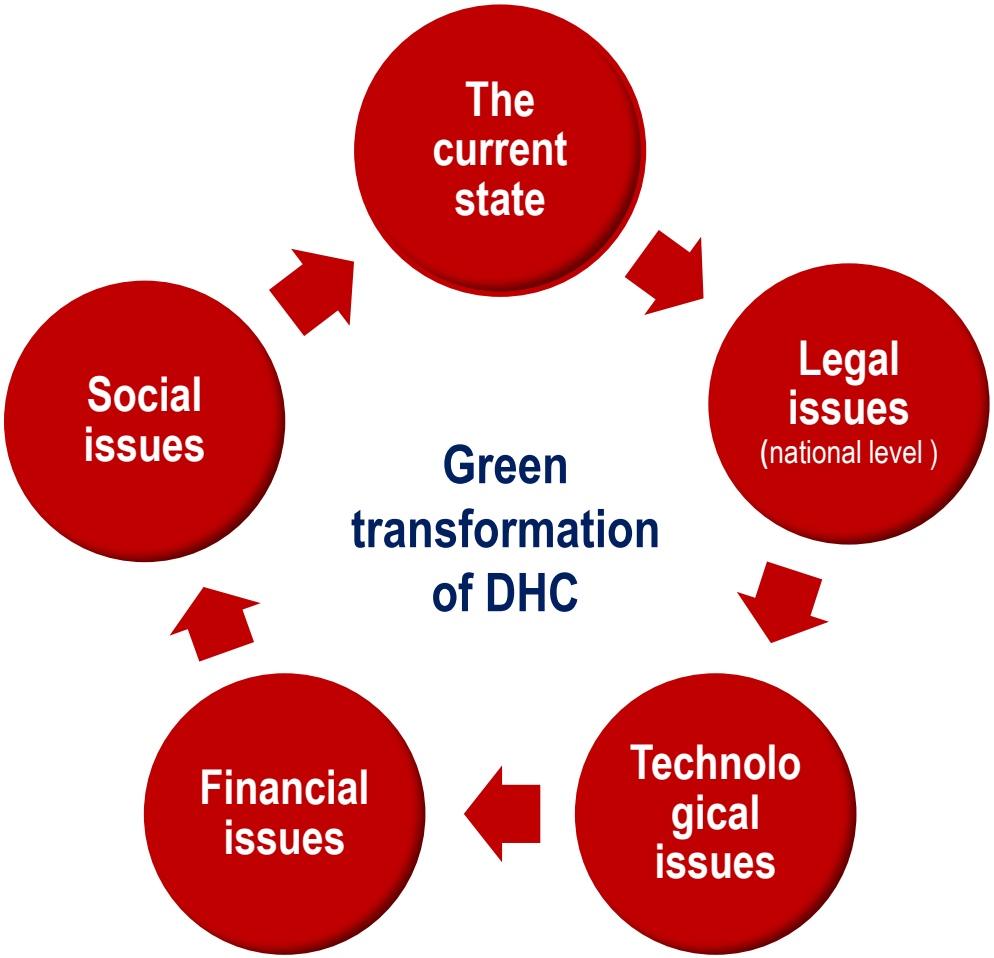
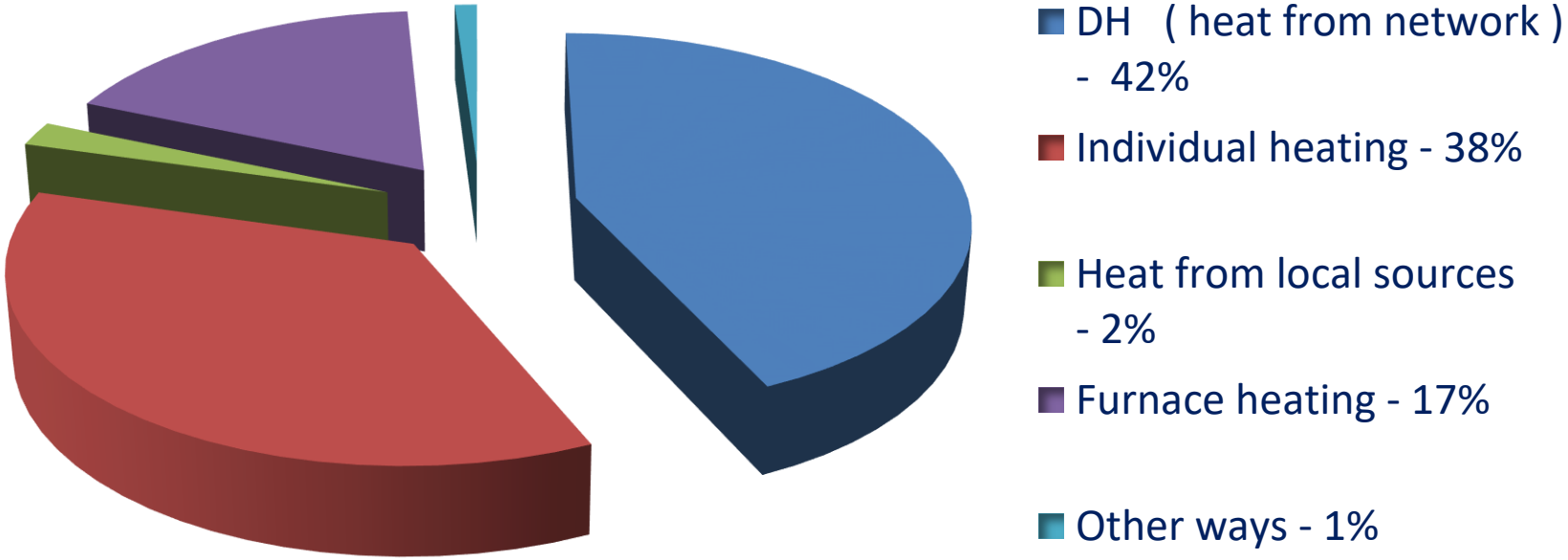
should be analyzed from various angles



Heat market in Poland

General view



Source: National Census - Central Statistical Office 2013

Structure of forms of heat supply to households in Poland in total

The potential of District Heating in Poland

Number of licensed Heating companies

396

Installed heating power MW

53 560

Heating power ordered by receivers MW

34 400

Length of heating networks km

21 700

Annual heat production TJ

400 000

share of heat from CHP

65%

Source: Energy Regulatory Office – Heat energy in numbers - 2019

DHC – the interdisciplinary sphere

DHC is the tool to achieve many goals of the EU energy-climate policy

CONSUMERS/CUSTOMERS

- Raising awareness,
- Necessity to start long-term educational programs and many incentives for rational behaviour,

ENERGY CARRIERS POLICY

- A broader approach to the structure of fuels to ensure energy security,
- Proper use of national energy carriers means greater EU-wide fuel independence,

BUILDINGS

- Strive to reduce energy consumption in the construction industry,
- Decarbonisation of buildings,

ENERGY SECURITY

- It is important from the heat the electricity perspective,
- Energy security means:
- New Building Permissions (CHP),
- Reduction of sudden closure effects,
- Flexibility of the energy system (CHP + heat accumulators),

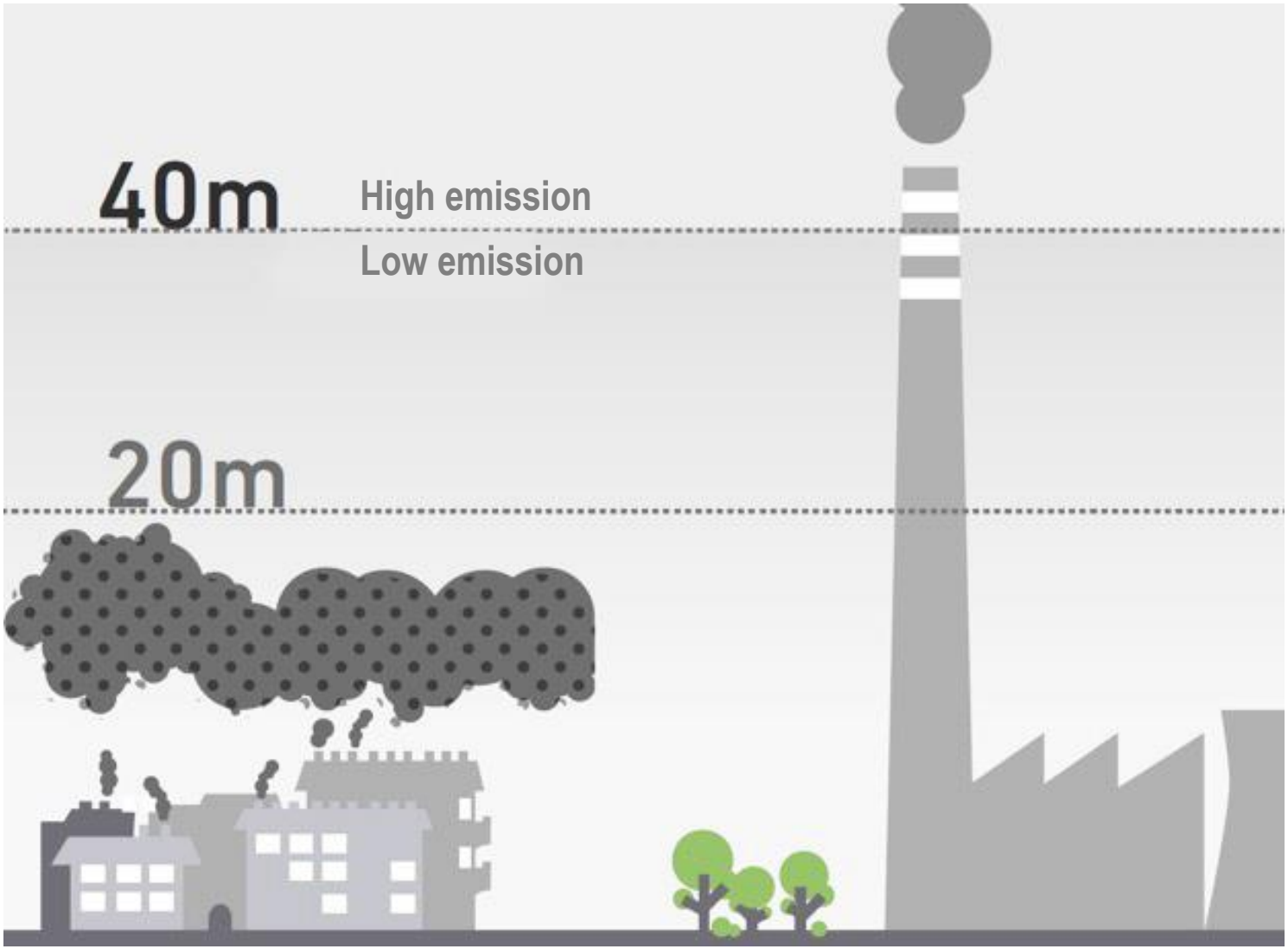
ENERGY EFFICIENCY

- Refers to the areas of production and distribution,
- Improvement of efficiency refers not only to buildings but also to enterprises,

ENVIRONMENTAL PROTECTION

- Analyzed from two points of view:
- Emissions from industrial sources (we can refer to IED and MCP directives)
- Low emission (from individual furnaces),

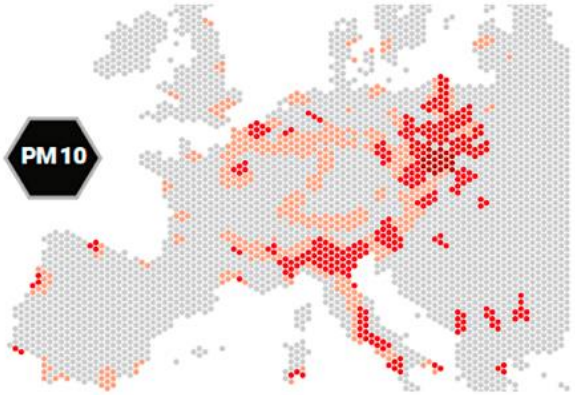
From the air protection perspective, pollutant emissions can be divided into low and high



The fight with low emission

Air pollution in Europe

Source: European Environment Agency 2015



Main sources of PM 10, PM 2.5 oraz benzo(a)pyrene

Source: General Environment Protection Inspectorate 2016.

PM 10

- 48.5% – combustion processes outside industry
- 9.3% – combustion processes in the energy transformation sector
- 9,0% – road transport
- 8,1% – combustion processes in industry
- 8.1% – production processes
- 4.9% – waste management

PM 2.5

- 49.7% – combustion processes outside industry
- 13.0% – road transport
- 10.0% – combustion processes in the energy transformation sector
- 7.7% – combustion processes in industry
- 6.8% – other vehicles and equipment
- 5.6% – production processes

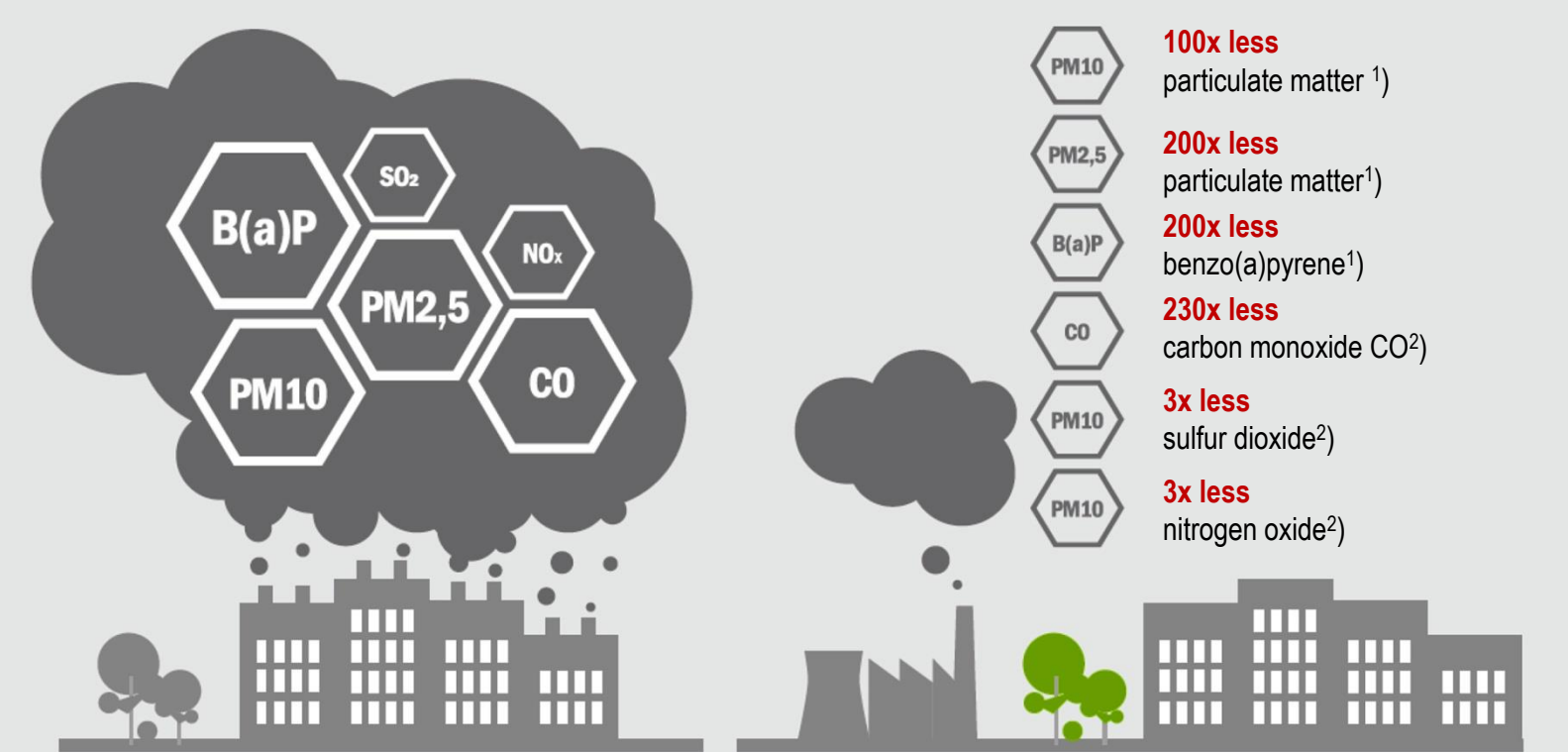
Benzo(a)pyrene

- 86.0% – combustion processes for heating individual buildings
- 10.3% – coking
- 1.8% – road transport
- 1.1% – aluminum production
- 0.5% – combustion processes in industry

Positive effects of using DHC

Possible levels of emission reduction by replacing individual heating with heat from the system

Source: Institute for Building Emission Certification, 2017

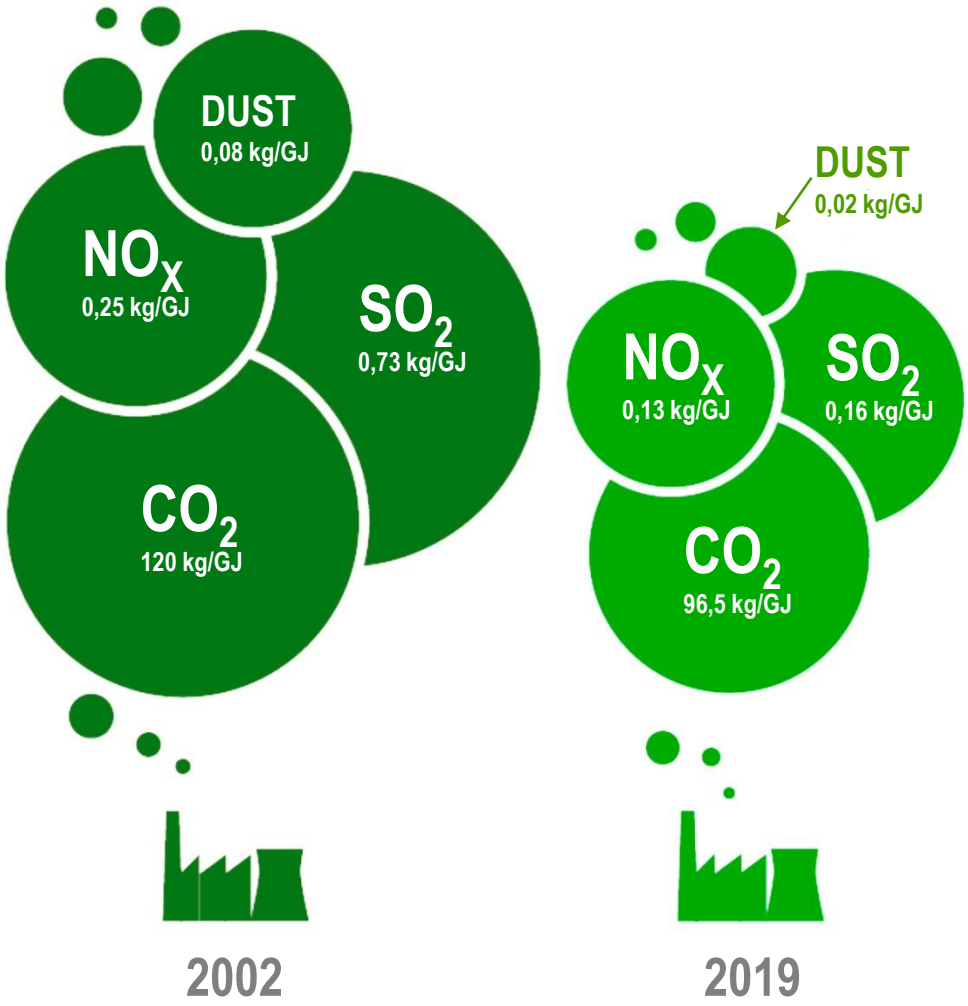


1) Average annual values of pollutants in the air near the ground surface. Applies to a professional heating plant or coal-fired CHP plant with a chimney with a height of 80 m compared to a typical medium-sized coal-fired boiler, with a chimney with a height of 10 m..
2) Total values of pollutants in the air. Applies to a professional heating plant or coal-fired CHP plant compared to a typical medium-sized coal-fired boiler .

Consequent reduction of high emission

Reduction of pollutant emissions in the Polish DH in 2002-2019

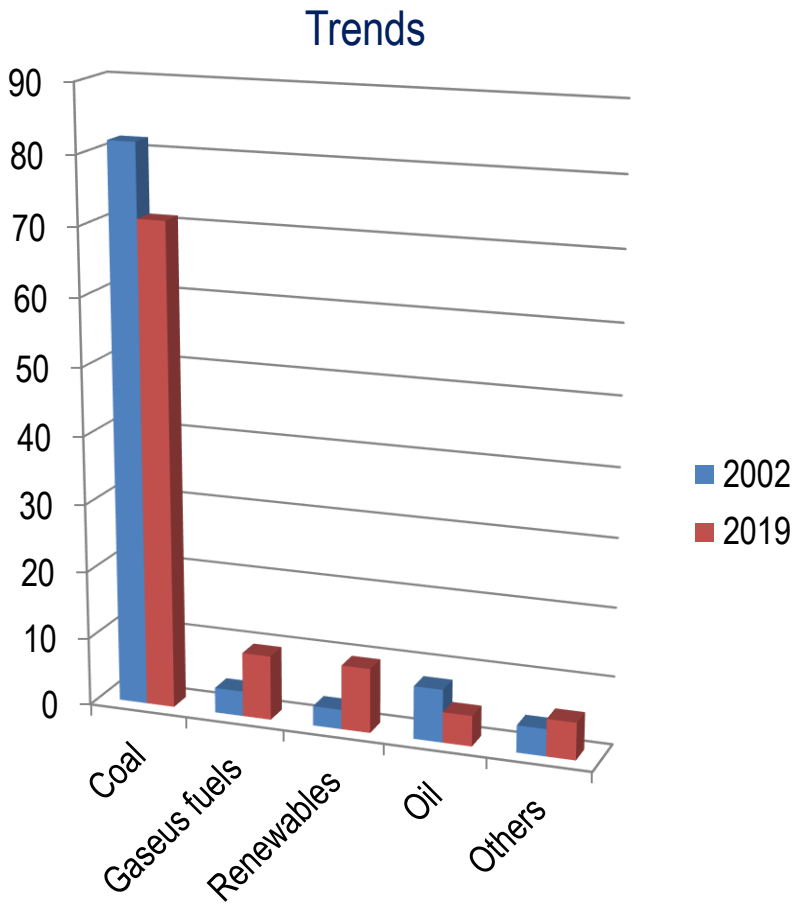
In 2002:
Dust – 0.14 Ton/TJ
NO_x – 0.26 Ton/TJ
SO_2 – 0.73 Ton/TJ
CO_2 – 120.8 Ton/TJ



In 2019:
Dust – 0.02 Ton/TJ
NO_x - 0.13 Ton/TJ
SO_2 – 0.16 Ton/TJ
CO_2 – 96,5 Ton/TJ

Source: Energy Regulatory Office

The structure of energy carriers



The main challenge is to reduce carbon dioxide emissions!

share in %

Fuel	2002	2019
Coal	81,7	71
Gaseus fuels	3,7	9,5
Renewables	2,9	9,5
Oil	7,8	4,5
Others	4	5,5

Source: Energy Regulatory Office

Legal issues (national level)

- **The national plan for energy and climate** assumes the share of renewable energy sources at the level of 28.4% in heating in 2030
- **Draft Energy Policy of Poland until 2040** - 28% of RES in DHC, natural gas will be a transition fuel in transformation, departure from coal combustion in households in cities by 2030, in rural areas by 2040
- **Strategy for district heating** (developed by the government in cooperation with economic self-government organizations)

Strategy for DHC

❑ **Directional goals**

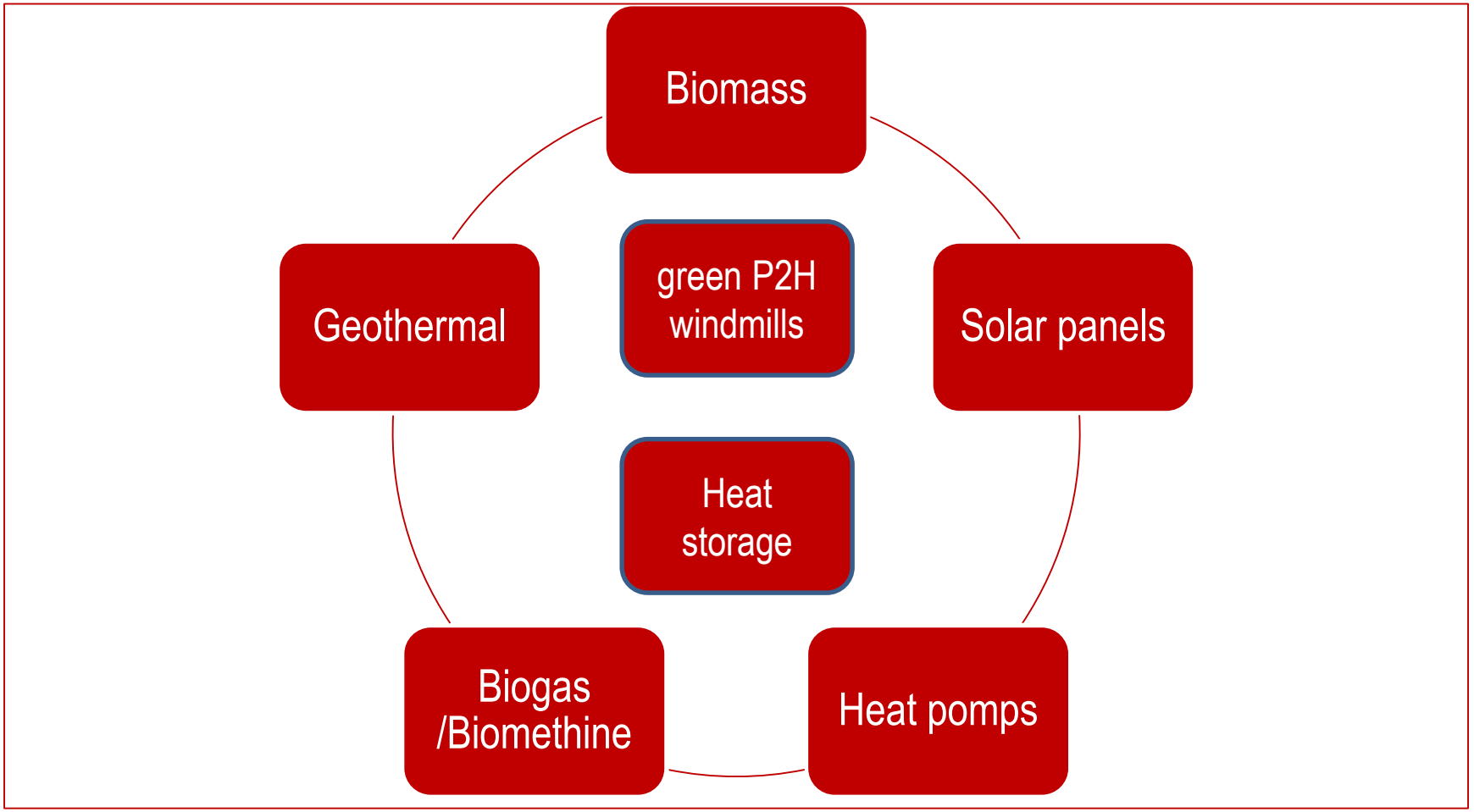
1. Ensuring thermal comfort for citizens
2. Improving air quality (eliminating low emissions) and reducing the impact on climate change
3. Improving energy security

❑ **Strategic goals**

1. An increase in the share of heat from RES in heating by 1.1-1.3 pp y / y to 2030 (base year - 2020)
2. Increase in electricity production from high-efficiency cogeneration by 2030 by at least 50% compared to the level of production in 2017
3. Meeting the criterion of an energy-efficient heating system by 100% of heating or cooling systems in which the power ordered by customers exceeds 5 MW by 2030
4. Reaching the level of at least 70% of households connected to the heating network in municipalities, on a national scale, by 2030
5. Achieving the level of 100% of households whose heat needs are covered by district heat or by low-emission individual heat sources by 2040

Technological issues

the most important renewable energy technologies for the entire heating sector



water temperature in the network

≈ 120/80 °C

≈ 60/40 °C

4G

Financial issues

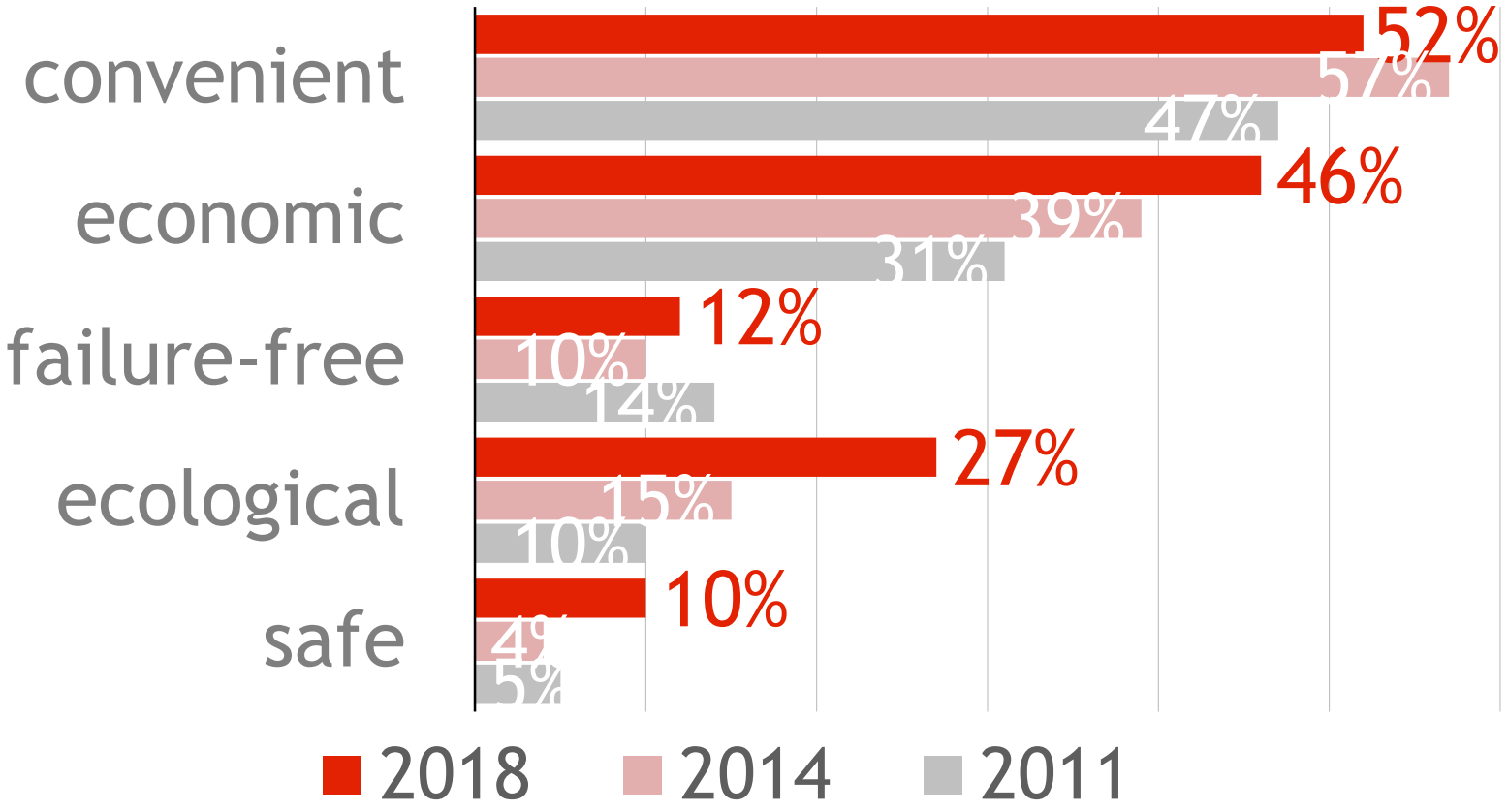
About PLN 200 billion will be allocated to the national energy and climate transformation by 2030, from EU and national funds under various mechanisms, including:

1. Cohesion Policy (allocation for Poland approx. PLN 90 billion)
2. Instrument for Reconstruction and Increasing Resilience (allocation for Poland approx. PLN 30 billion),
3. Just Transition Fund (allocation for Poland around PLN 15.5 billion)
4. ReactEU (allocation for Poland approx. PLN 4 billion)
5. Other instruments (e.g. priority programs of the National Fund for Environmental Protection and Water Management and funds from the Common Agricultural Policy approx. PLN 20 billion)
6. New instruments (e.g. the Modernization Fund and the national purposeful fund, supplied with funds from the sale of CO_2 emission allowances, i.e. the Energy Transformation Fund, estimated at approx. PLN 46 billion)

Source: Draft Energy Policy of Poland until 2040

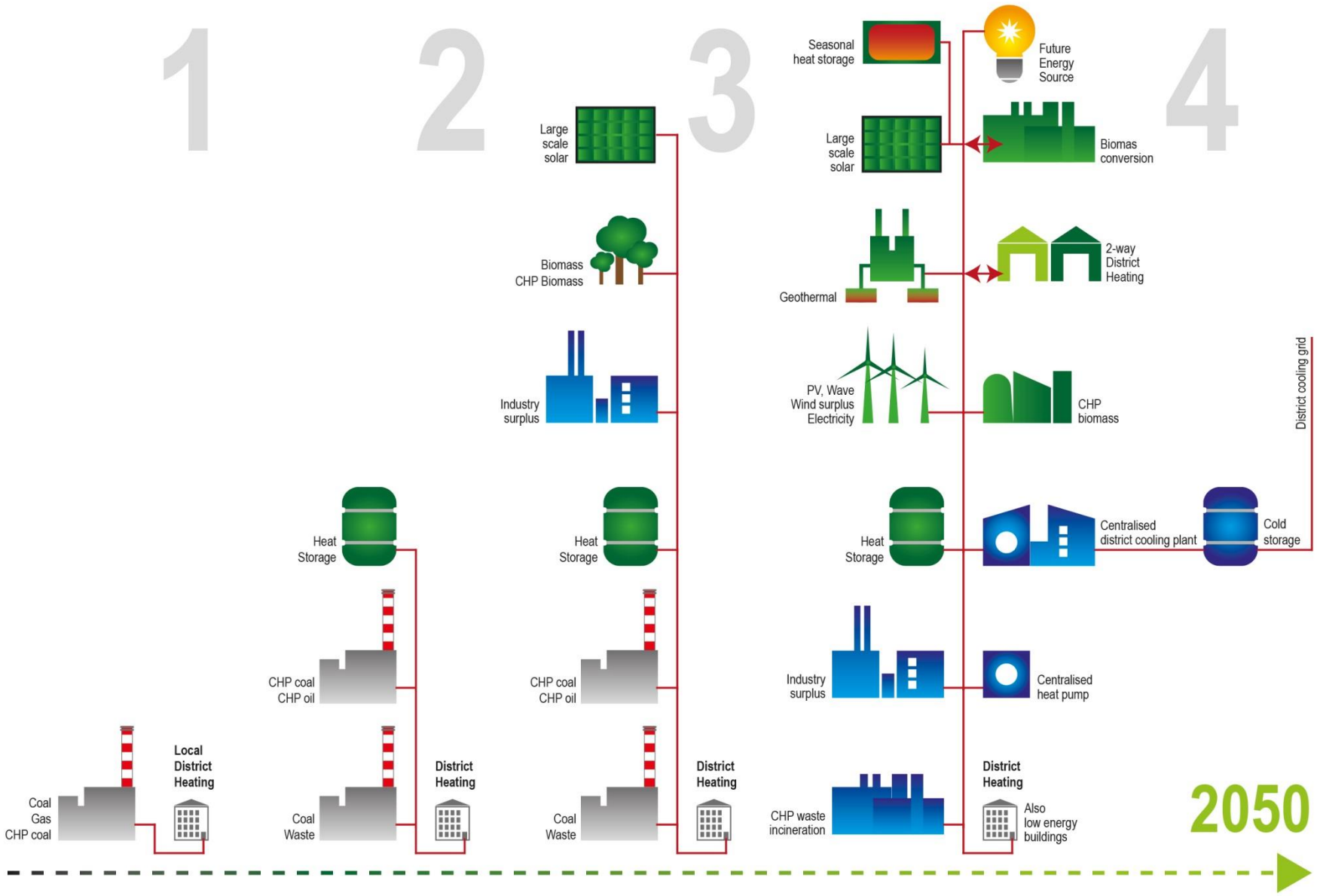
Social issue

What should the ideal heating be like? What features should it have?



The comparison of the results from three studies in 2011-2018 clearly shows the growing importance of ecology for both the business group and end users

Development from 1G DHC to 4G DHC as a way to green transformation



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Thank you for your attention

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