49% renewables in buildings - how to get there?

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"We sit at a crossroad. The IPCC report raised the alarm, we are in a state of emergency. Yet, there is ample evidence that net-zero is achievable and far less costly than the costs of non-action. Climate technologies are available, new ones are coming. **Speed and scale** is now what matters."

24%

The solutions exist

- Heat Pumps
- Hybrid Systems
- Biomass Systems
- Solar Heat
- Condensing Boilers
- Electric Direct Heating
- PV modules
- Battery storage

With the right renewable energy source

Solar | Air | Geothermal | Electricity | Biomass | Green Fuel | Green Gas

How to reach 49%:

#1

Scale renewable solutions

with green electricity and green gazes

#2

Activate prosumers

#3

Bring people along

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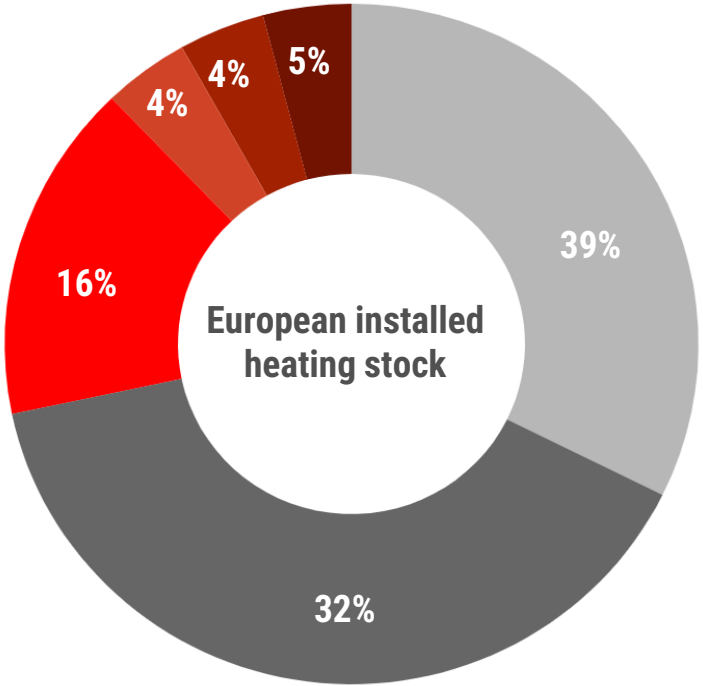
Massive potential for renewables uptake in buildings

41.2 Mio.	Gas non-condensing boilers
33.8 Mio.	Gas condensing boilers
16.9 Mio.	Oil boilers (condensing and non-condensing))
4.2 Mio.	Heatpumps
4.2 Mio.	Biomass boilers
5.3 Mio.	Other



The majority of the installed 105.7 million space heaters are inefficient and based on fossil fuels

- Increase replacement to 6%/y (from 4% today)
- Incentivise the roll-out of renewable heating
- Set green fuels target for buildings

Source: ehi (2019)

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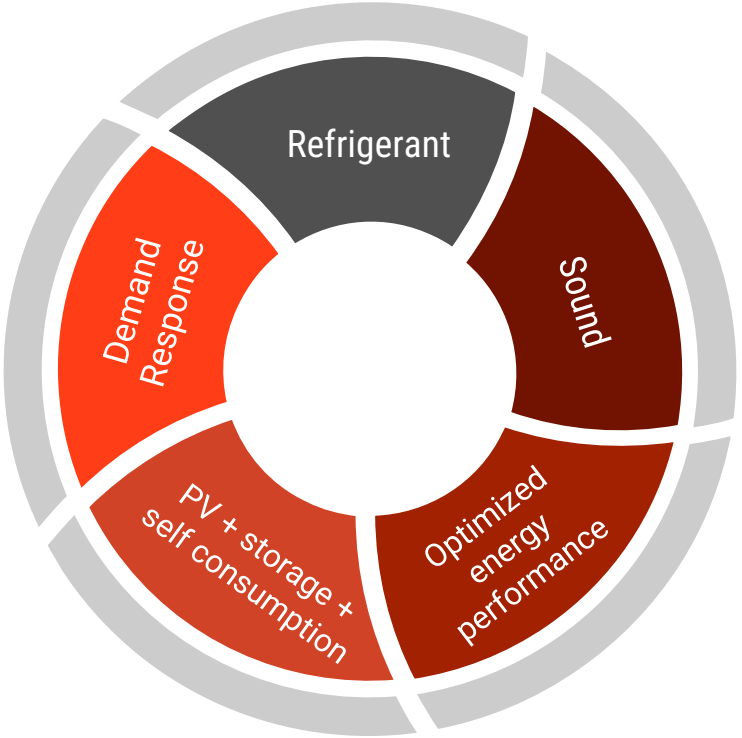
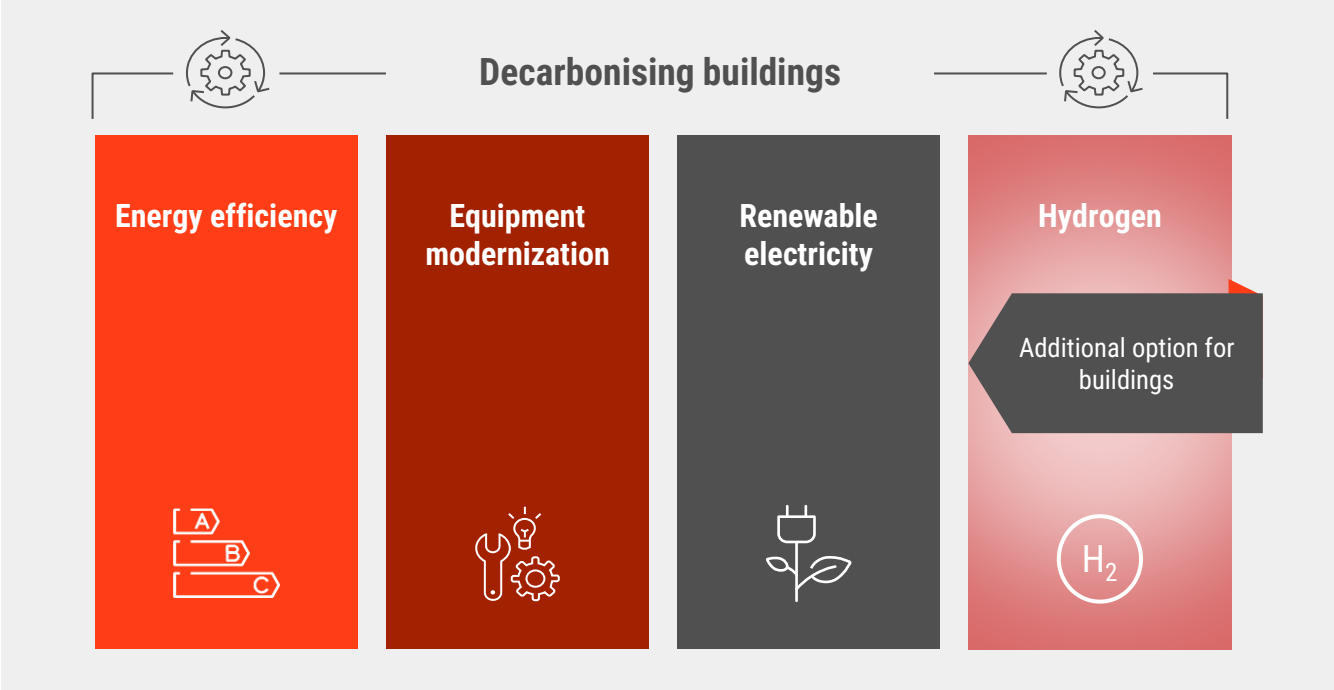
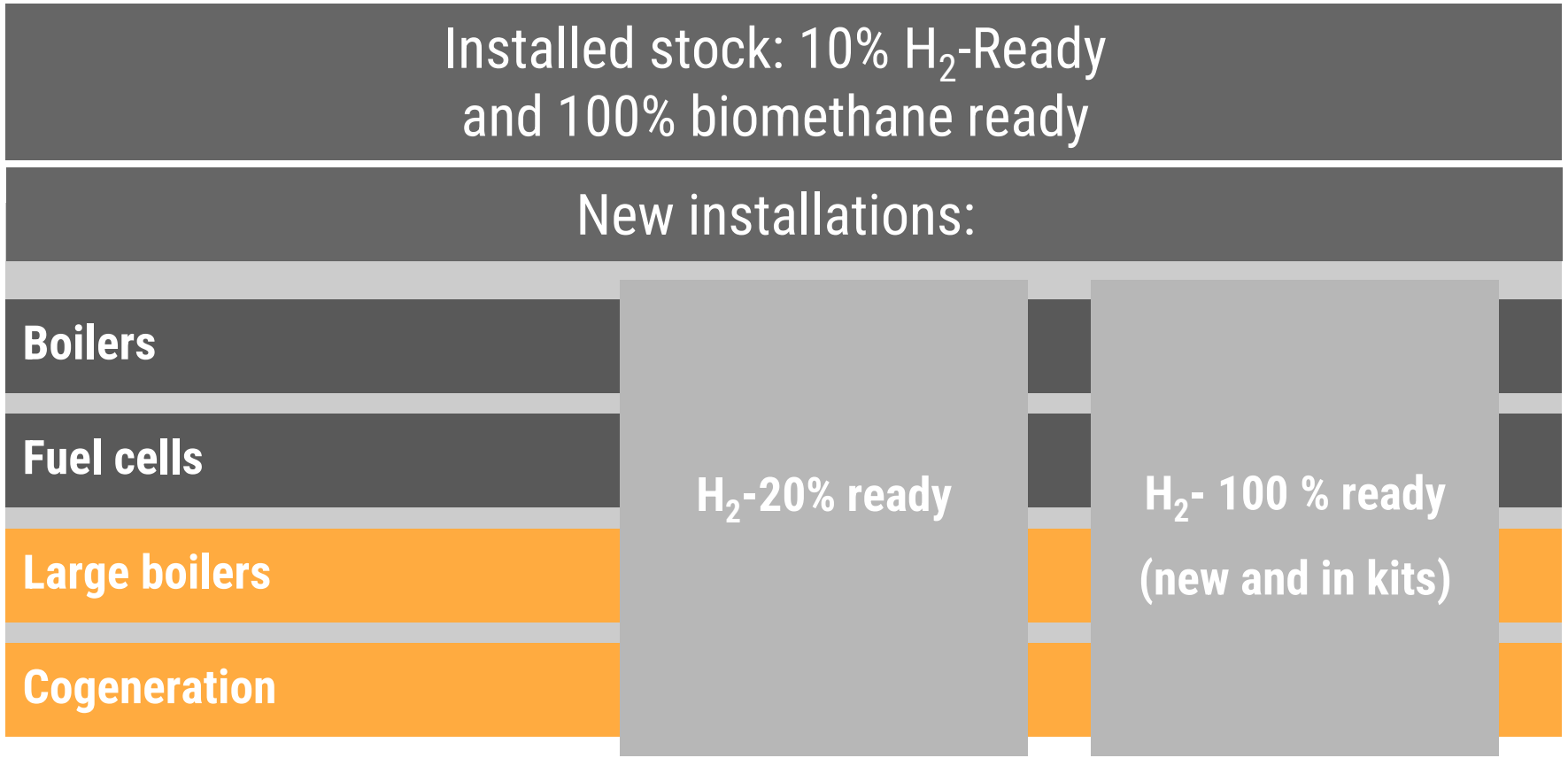
Ensure that the heat pump ramp-up meets its promises



Leverage potential of hydrogen for the hard-to-abate building stock



Synchronize decarbonisation of gas with end-use appliances to avoid lock-in of fossil fuels



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2: Activate prosumers

50%

of people could become active prosumers

A no-regret move - Active buildings:

-maximise system efficiency via demand response

-reduce the need to fall back on fossil energy during peak times

-reduce energy costs for occupants

-enable direct participation of people in the energy transition

What we need to do:

Make distributed prosumer resources attractive and reward demand-side flex, integrate on-site RES elec via “fair” self-consumption, and “firm” mCHP.

Take a holistic response to system performance of buildings beyond mere reduction of energy consumption in EPBD.

Increase training capacities and skilled workforce capabilities.

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2: Bring people along

34 million
Europeans live in energy poverty.

x2
Share of wallet spent on energy by low-income households in the last 20 years.

People buy-in is sine qua non for success

450 million stakeholders

Direct impact on people's everyday lives

Potential for erosion of support for the transition

What we need to do:

Use carbon pricing revenues directly in the sector.

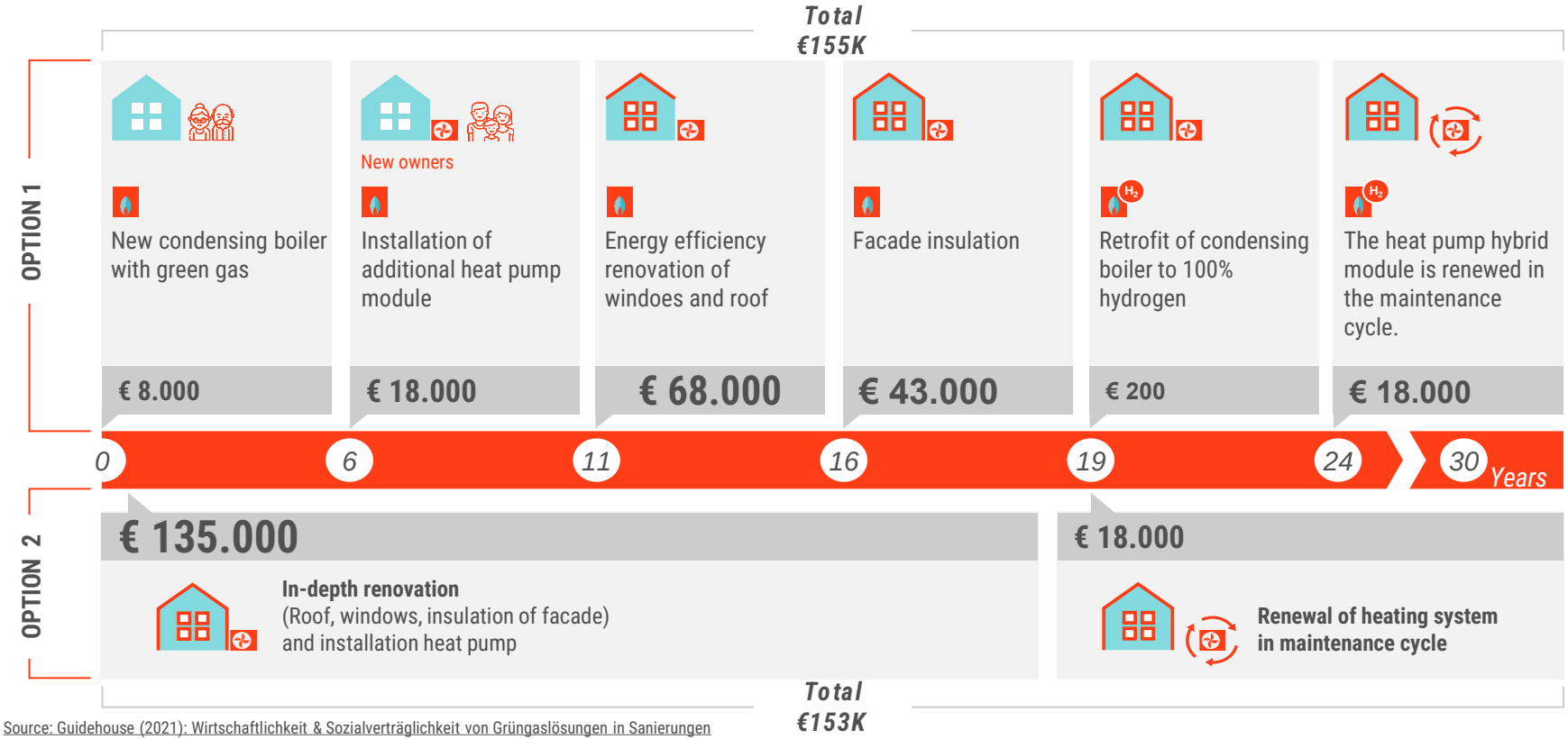
Mitigate increasing energy prices

Provide flexible range of options that fit different lifestyles.

Find financing instruments to support high upfront costs

Secure financing and scale new business models such as **heating as a service.**

Staged modernisation offers flexibility, time and affordability

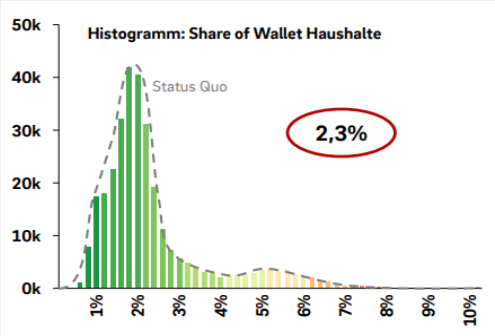


Source: Guidehouse (2021): Wirtschaftlichkeit & Sozialverträglichkeit von Grüngaslösungen in Sanierungen

Green gases in heating can soften financial burden on households

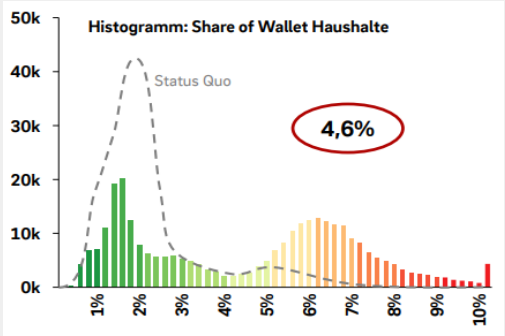
“Share of Wallet for heating, Histograms in the year 2050 for the city of Essen

Status Quo Essen



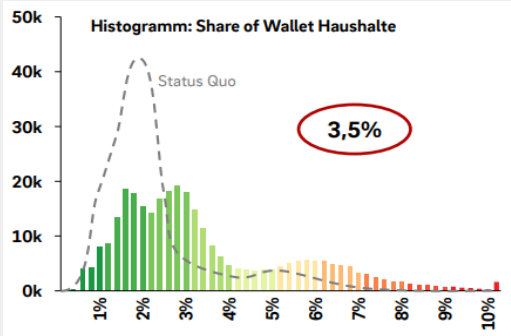
- Around 100,000 buildings in Essen, with around 312,000 households
- 56% gas, 17% district heating, 17% oil, 7% night storage, <1% heat pump, other 2%

Scenario “Electrification”



- Renovation rate for full electrification hardly implementable - 2.1% equals renovation of more than 24k buildings by 2030
- share of wallet” doubles→ increasingly disproportionate loads

Scenario “Green Fuels”



- Renovation rate of 1% more realistic
- mix of green gases and green electricity leads to a more balanced distribution - share of wallet increases moderately

Source: E.ON Studie “Essen Digital Energy Twin” (2021)

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