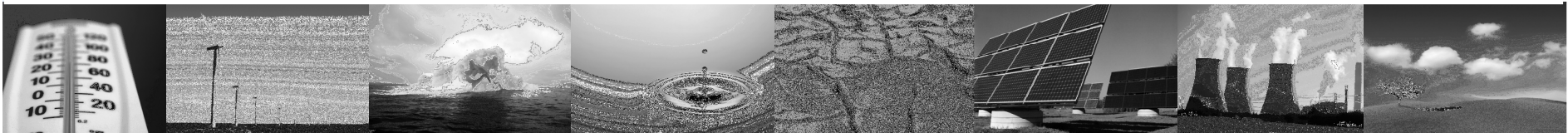


CONFIDENTIAL

Swiss Greenhouse Gas Abatement Cost Curve

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Klimafachtagung
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Myths and realities on potential and cost of CO₂ abatement in Switzerland

Myths

- **Limited amount** of opportunities to reduce CO₂ in Switzerland
- Opportunities are concentrated in the **industry and power** sectors
- CO₂ savings are **costly** to society and economy
- We can only achieve the required abatement through **new technology**
- We cannot afford to invest billions to achieve the reduction

Realities

- Switzerland has a technical potential to reduce CO₂ by **45% by 2030**
- **Transportation and buildings** represent > **50%** of the total potential
- **40-80%** of all measures could **also save costs** while saving CO₂
- The majority of measures can be achieved through **increased efficiency with current technology**
- Investments to realize all technical measures would amount to only **~0.7% of GDP annually**



Agenda



Our methodology and approach

The Swiss CO₂ abatement cost curve

Abatement scenarios and implications



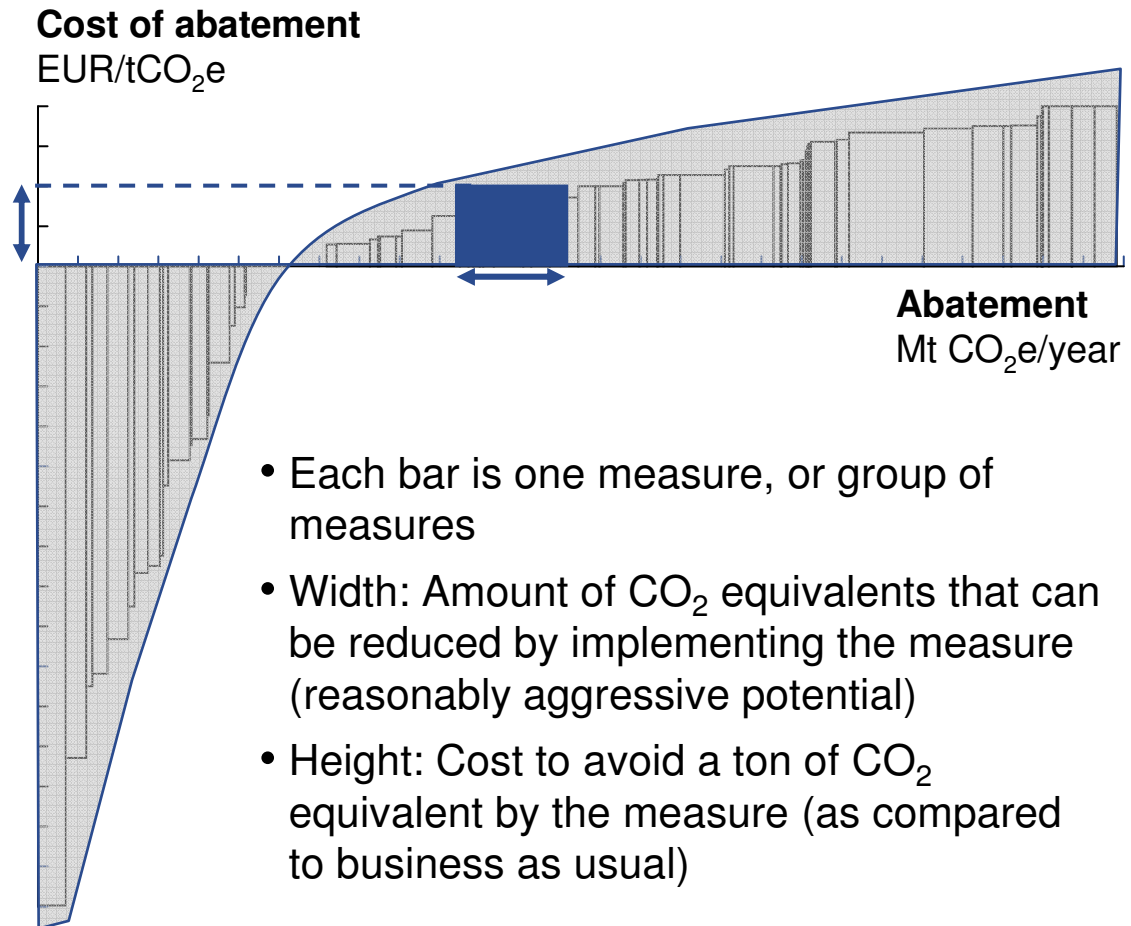
We have quantified greenhouse gas abatement opportunities according to our standardized methodology

- **Scope:** 3 sectors in detail: buildings, power, transportation

- **Timeframe:** 2030

- **Involvement:**

- Experts from McKinsey Global Climate Change Initiative
- Economiesuisse, Experts, WWF



Calculation logic and assumptions for the abatement cost

Cost includes...

- Operating costs, incl. personnel/materials costs
- Investment costs calculated with economic amortization period and capital costs
- Cost savings generated (mostly energy savings)

Cost does not include...

- Transaction costs
- Communication/information costs
- Taxes

Key assumptions

- Oil price of USD 52 as base case and related costs for other energies
- Economic costs from a societal perspective
 - Interest rate of 2.5%
 - Assumed lifetime of assets based on real average life length
- Abatement curve shows the maximum “technical potential” of abatement, not the “economic potential” or the “market potential”

Behavioral changes are not included in our cost curve but do present additional abatement potential



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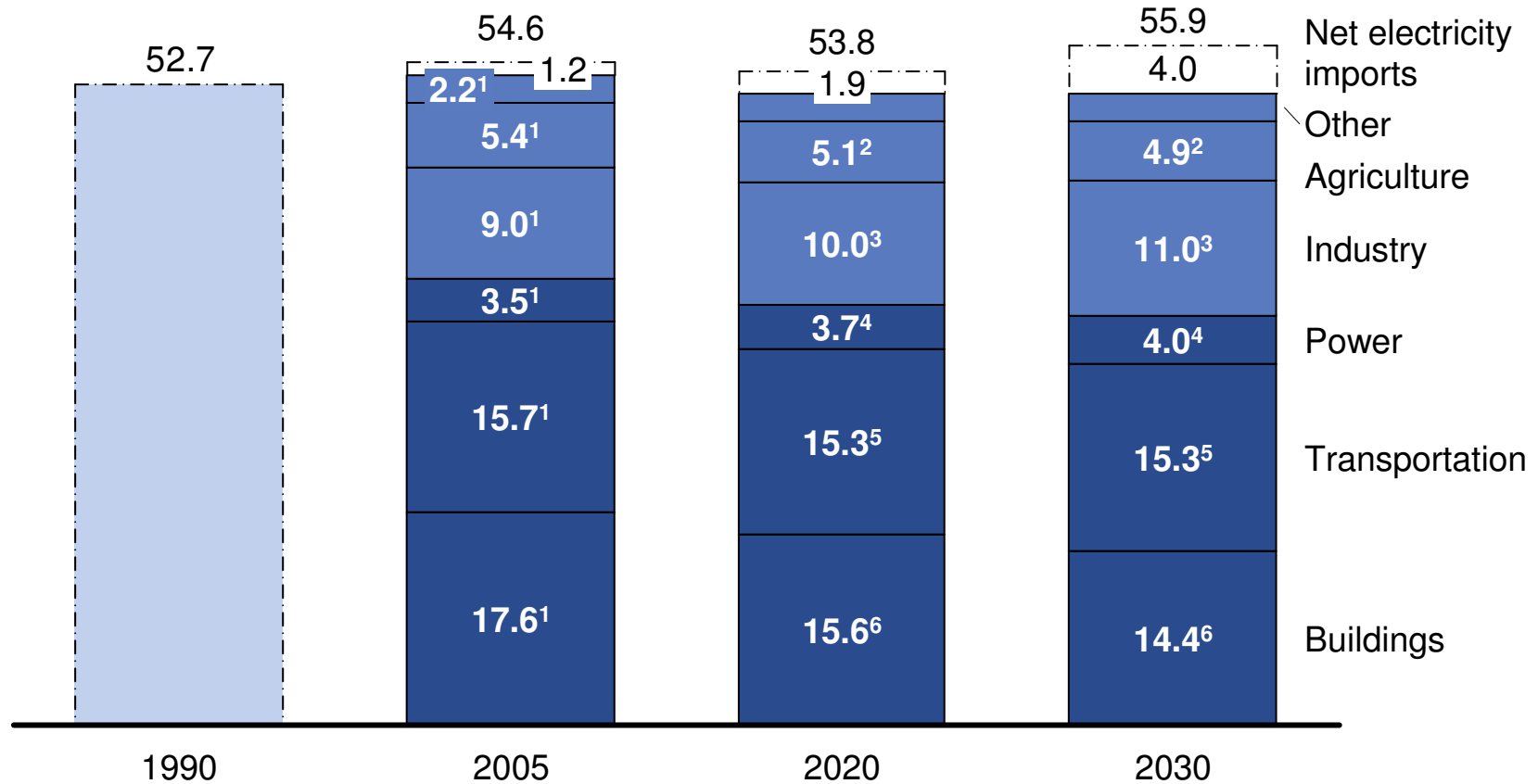
Abatement scenarios and implications



Slight increase of CO₂e emissions expected in reference scenario („business as usual“)

Breakdown of GHG emissions into sectors for Switzerland

MtCO₂e



¹ IEA, National Inventory Report 2005

² Global Anthropogenic Emissions of Non-CO₂ Greenhouse Gases 1990-2020 (EPA Report 430-R-06-003)

³ Top-down estimation based on the forecasted production growth (GDP share) and the German energy efficiency improvement until 2030

⁴ Prognos (2007): Energieperspektiven 2035; petroleum refinery emissions not modeled (~20%), assumed to remain constant until 2030

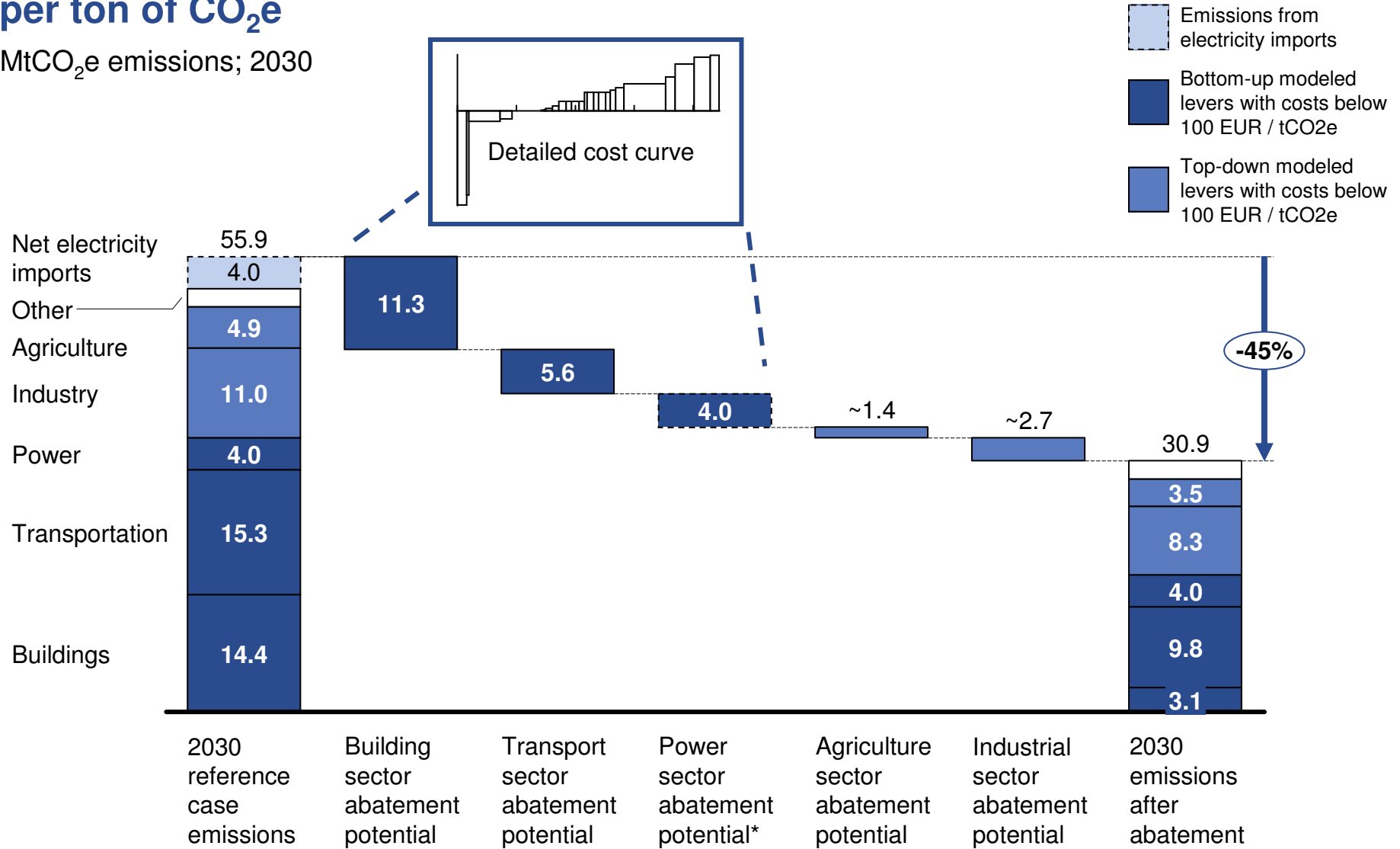
⁵ Infras (2007): Energieverbrauch im Verkehr 1990-2035; emissions from motorbikes, tank tourism and off road transport not modeled (~16%), assumed to remain constant until 2035

⁶ BFE (2007): Energieverbrauch der Dienstl./Landwirts. (CEPE) sowie der Privaten Haushalte (Prognos) 1990 - 2035



Total reduction potential of 45% by 2030 with measures below CHF 100 per ton of CO₂e

MtCO₂e emissions; 2030



* Power sector potential limited by the amount of emissions from net electricity imports

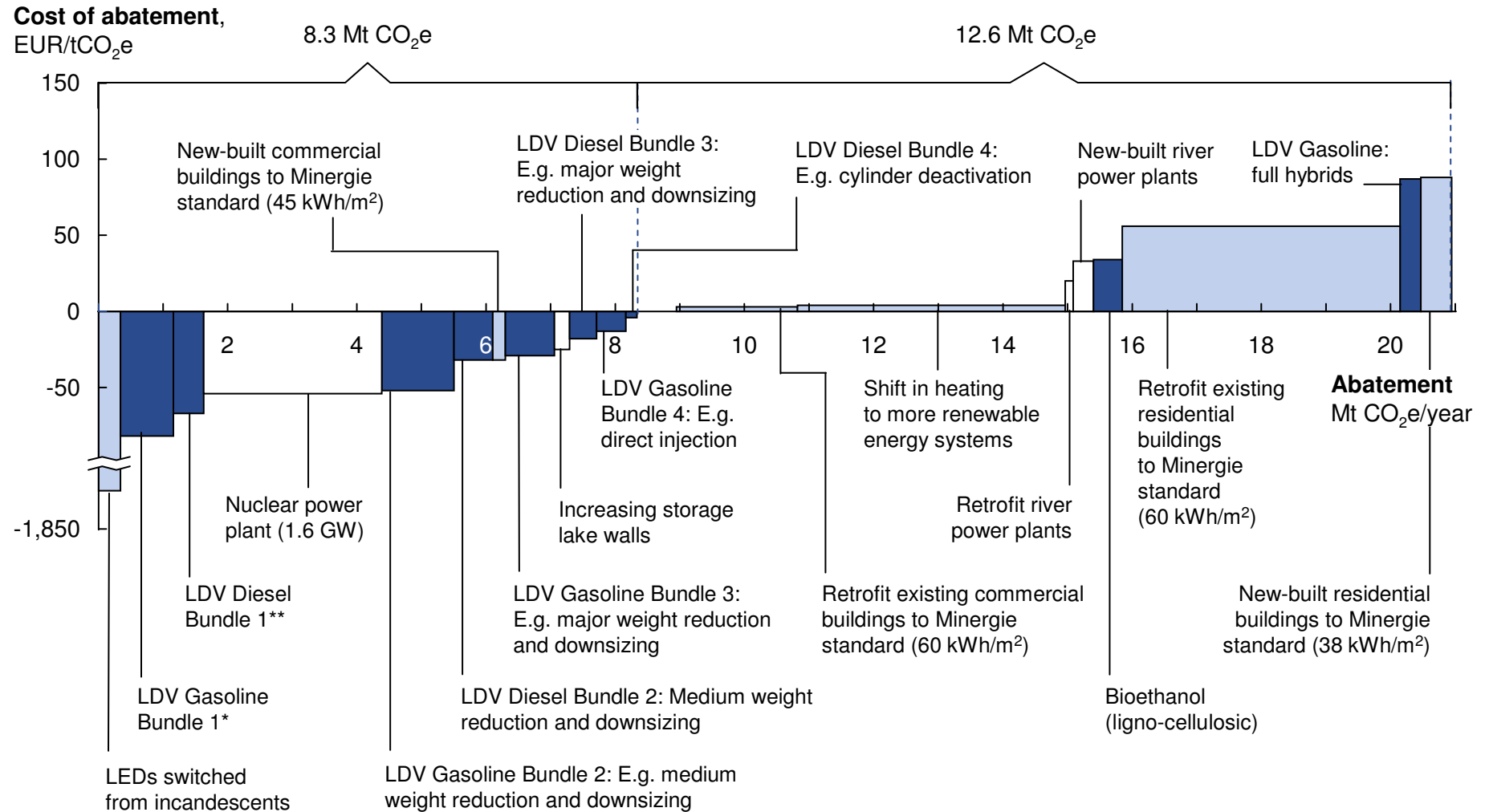
Source: McKinsey



Overall Swiss GHG abatement cost curve: base case \$52 oil price scenario

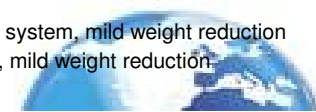
2030, measures with costs below €100 per tonne of CO₂

- Transport measures
- Building measures
- Power measures



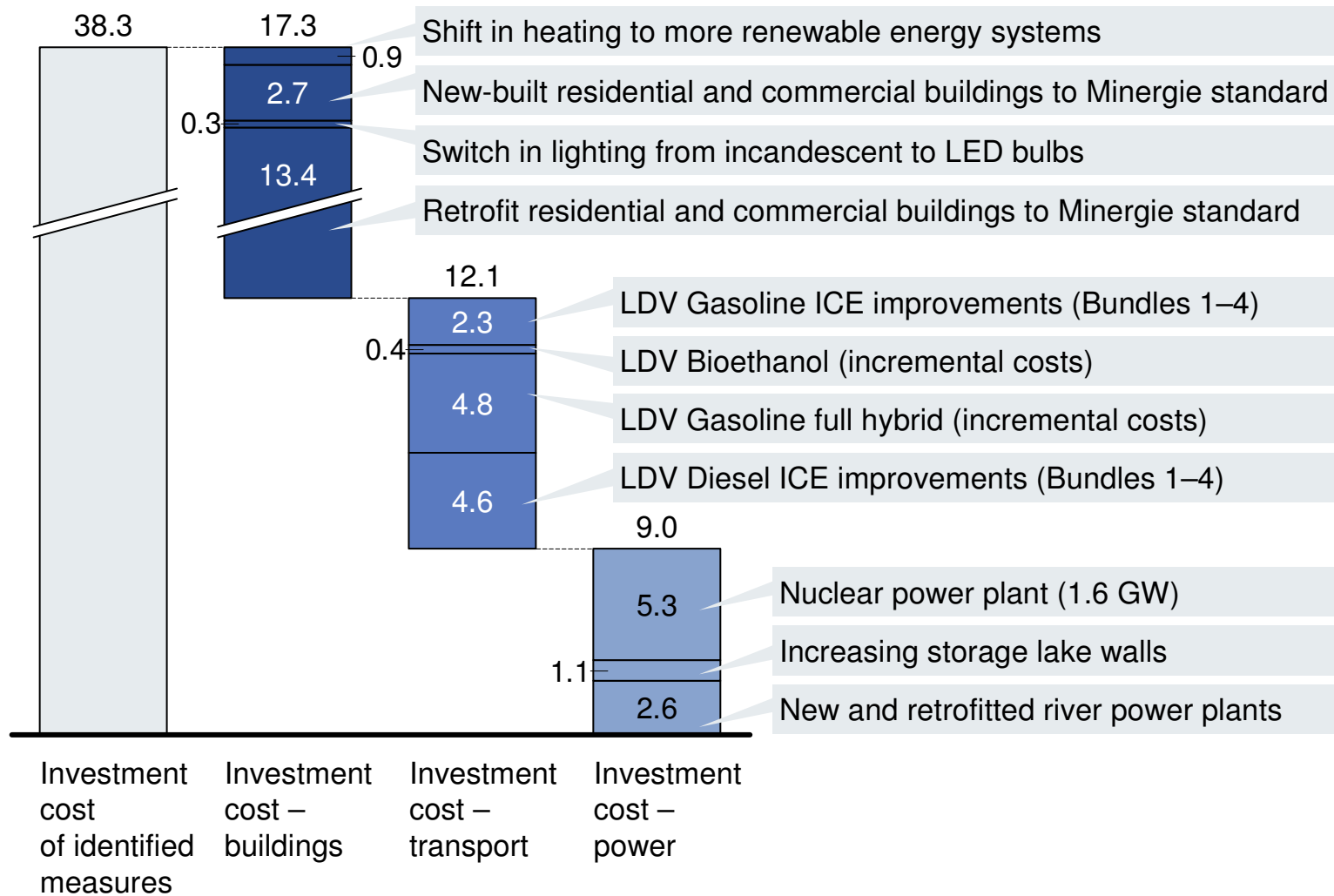
* LDV Gasoline Bundle 1: Including variable valve control, engine friction reduction (mild), low rolling resistance tires, tire pressure control system, mild weight reduction

** LDV Diesel Bundle 1: Including Torque oriented boost, engine friction reduction, low rolling resistance tires, tire pressure control system, mild weight reduction



Base case overall investment cost of €38 billion over the period from 2010 to 2030, 0.7% of Swiss GDP per annum

€ billion, measures with costs below € 100 per ton of CO₂e, 2010–2030



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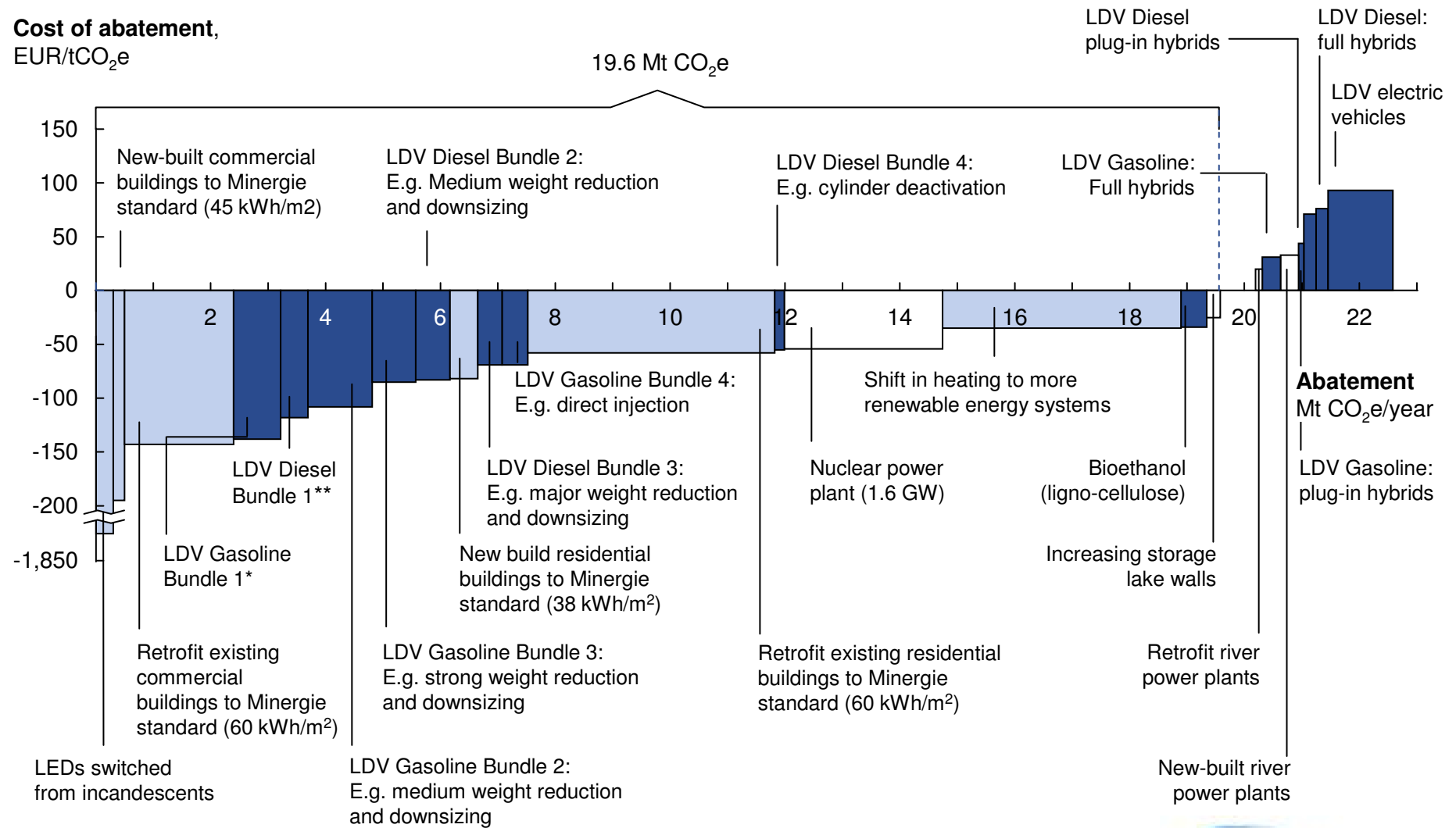


\$100 oil price scenario: >80% of measures saving costs

2030, measures with costs below €100 per tonne of CO₂

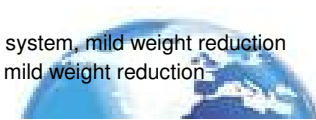
- Transport measures
- Building measures
- Power measures

Cost of abatement,
EUR/tCO₂e



* LDV Gasoline Bundle 1: Including variable valve control, engine friction reduction (mild), low rolling resistance tires, tire pressure control system, mild weight reduction

** LDV Diesel Bundle 1: Including torque-oriented boost, engine friction reduction, low rolling resistance tires, tire pressure control system, mild weight reduction



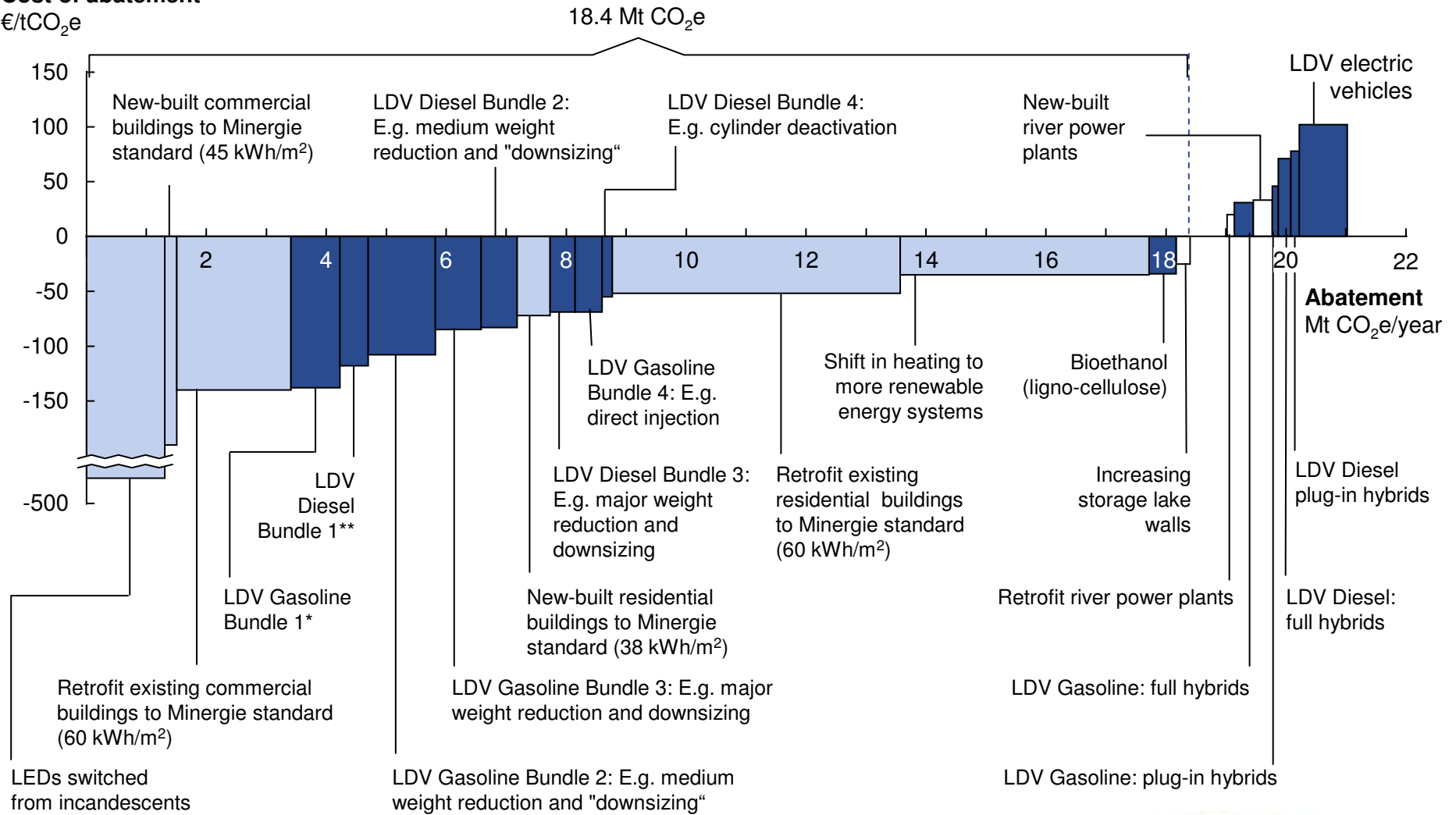
Scenario with additional electricity savings at \$100 oil-price

2030, measures with costs below €100 per tonne of CO₂e

- Transport levers
- Building levers
- Power levers

Cost of abatement

€/tCO₂e



* LDV Gasoline Bundle 1: Including variable valve control, engine friction reduction (mild), low rollinAg resistance tires, tire pressure control system, mild weight reduction

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