

PRESS DAY 2019

CLIMATE: WHAT NOW?



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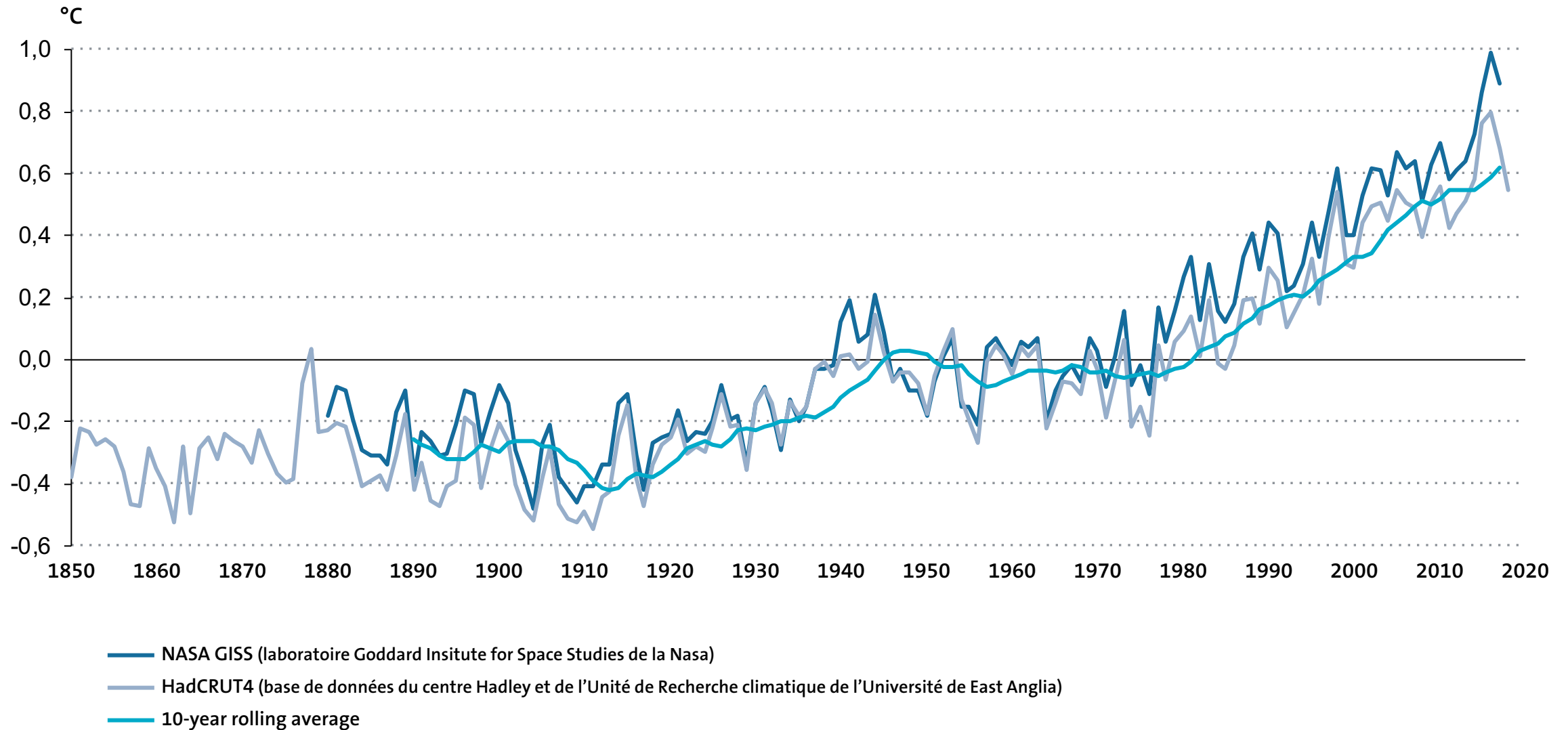
STUDY ROLAND BERGER



Energy and environment sector solutions to the challenges of climate change



DIVERGENCE FROM REFERENCE TEMPERATURE WORLDWIDE

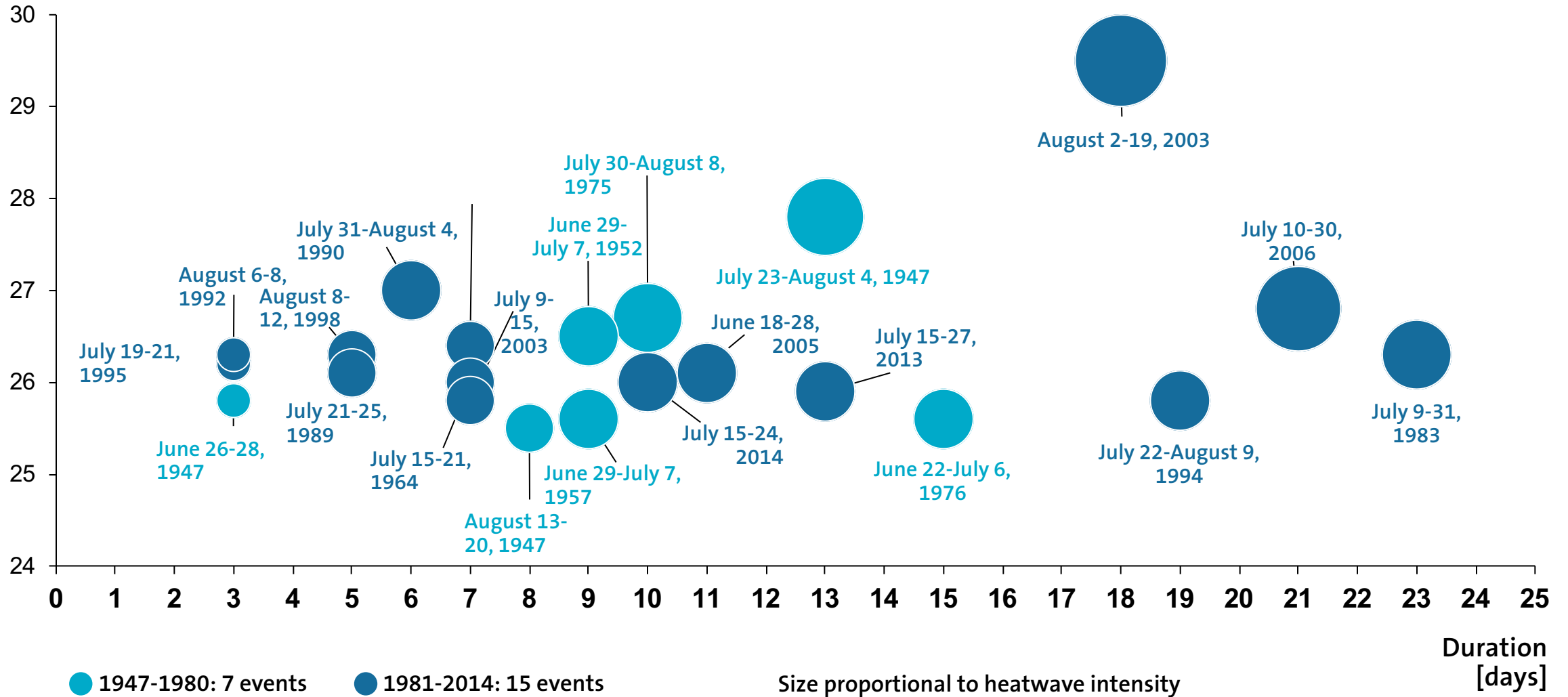


Reference: annual average temperature, 1961 to 1990.

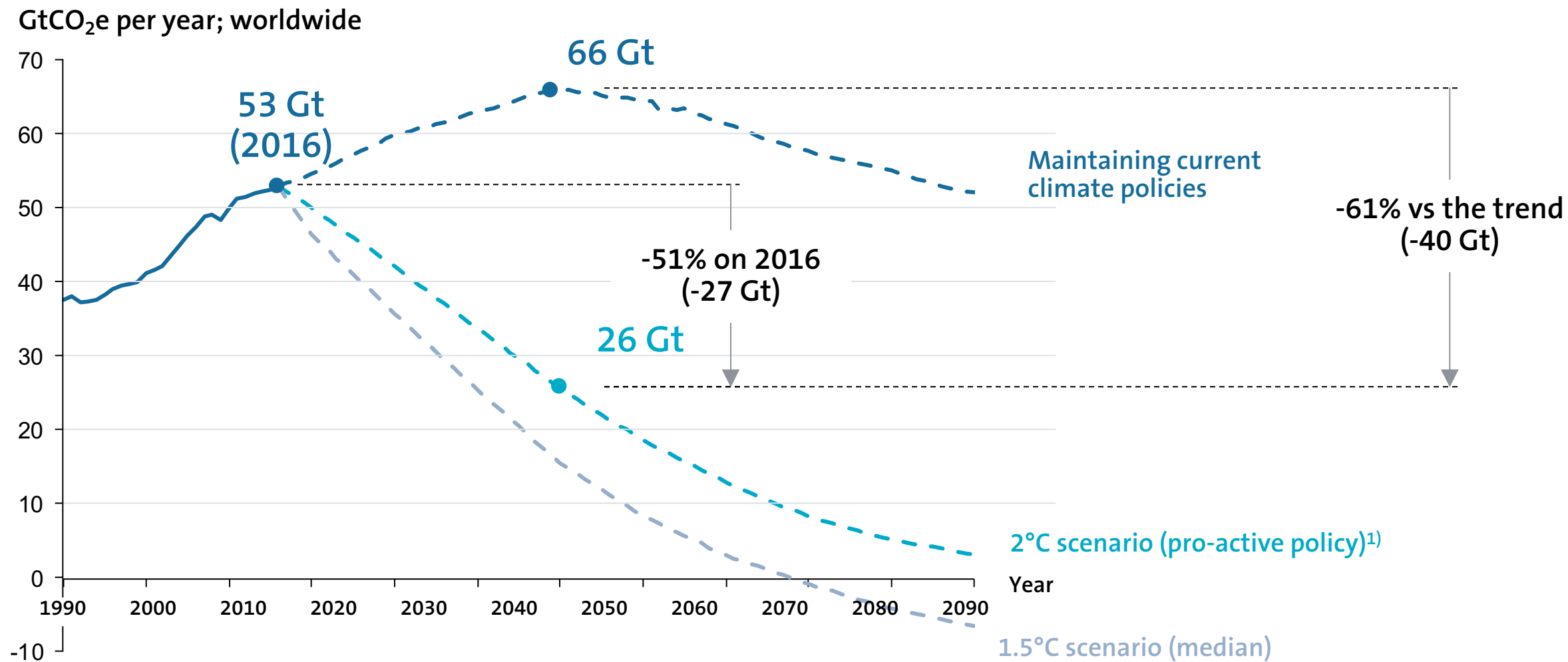
Source: NOAA, NASA, Hadley Center, Roland Berger

HEATWAVES IN FRANCE

Maximum average daily temperature, continental France [°C]



GROSS GREENHOUSE GAS EMISSIONS WORLDWIDE

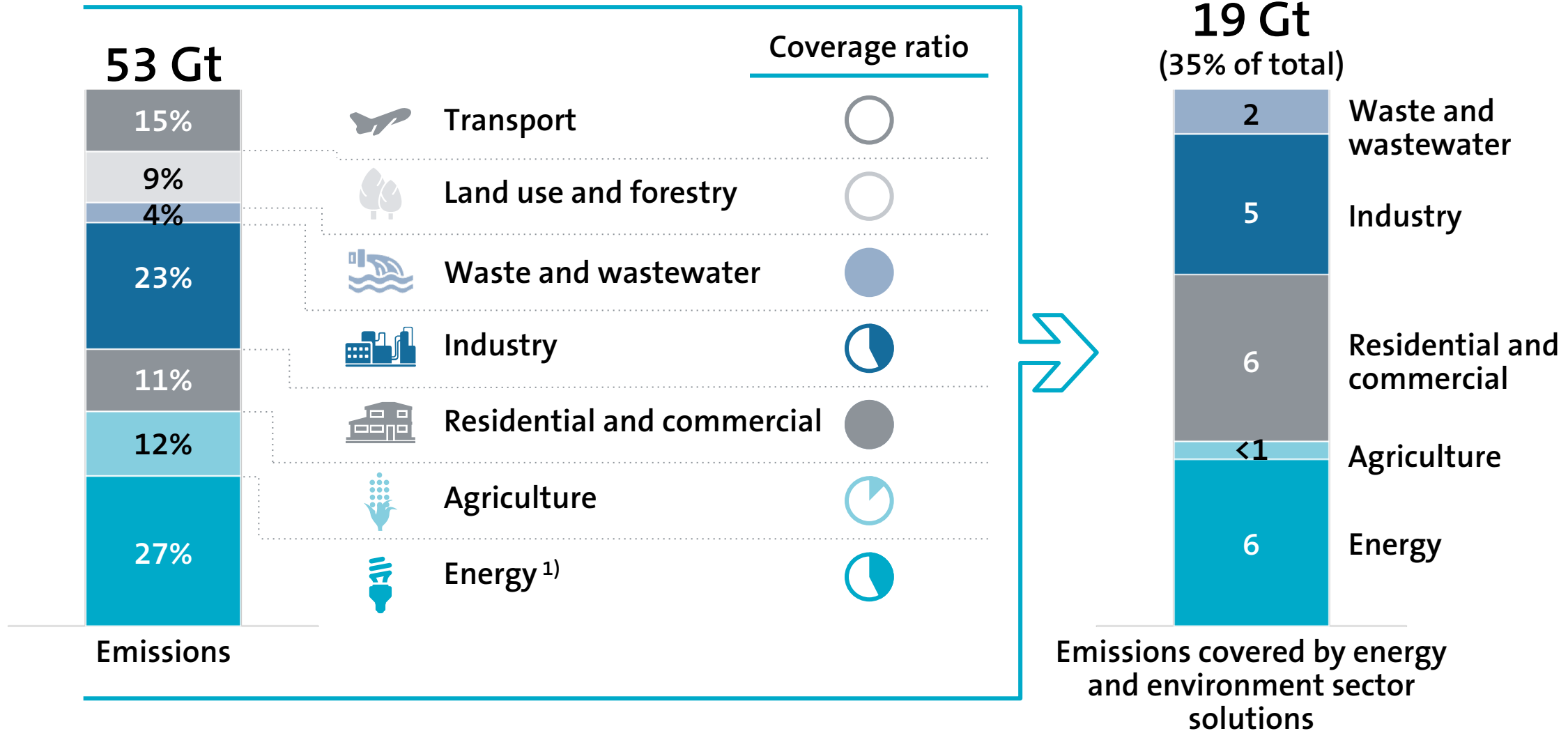


Historical data up to and including 2014. Forecasts for 2015-2020 restated

1) 2°C scenario, median IPCC forecasts

Source: EDGAR, IPCC, Roland Berger

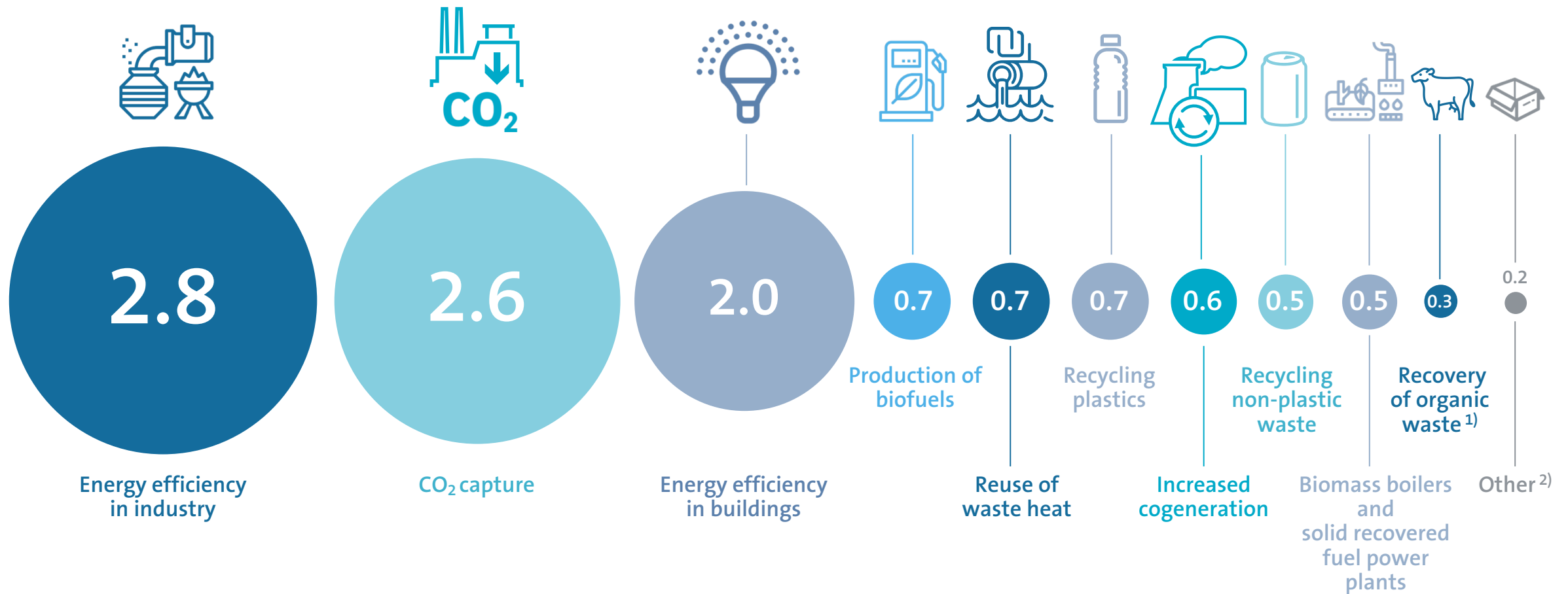
WORLDWIDE GREENHOUSE GAS EMISSIONS BY SECTOR



In GtCO₂e per year. 2016 data. 1) Energy transformation

Source: PBL Netherlands Environmental Assessment Agency, EDGAR, World Energy Outlook, Roland Berger

POTENTIAL GREENHOUSE GAS EMISSIONS AVOIDED IN 2050



TOTAL: 11.7 GtCO₂e / YEAR

1) Anaerobic digestion and muck spreading

2) Incineration of non-recyclable waste, better yields from potable water systems, spreading digestates and sludges from wastewater treatment plants

Roland
Berger
THINK:ACT



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ANTOINE FRÉROT



UNEQUAL MATURITY OF ENVIRONMENT SECTOR SOLUTIONS

ASSESSMENT OF SOLUTIONS IN 2018



MITIGATION SOLUTIONS

- › Increase energy efficiency in industry
- › Increase energy efficiency in buildings
- › Increase CO₂ capture
- › Production of biofuels
- › Use lost heat from industry and waste water
- › Recycling plastic waste
- › Increase cogeneration
- › Recycling non-plastic waste (paper, card, metal, glass)
- › Increase use of biomass boilers and solid recovered fuel plants
- › Recovery of organic waste: anaerobic digestion , soil improvement
- › Incineration of non-recyclables instead of landfill
- › Improve yield of drinking water supply systems
- › Increase energy storage

ADAPTATION SOLUTIONS

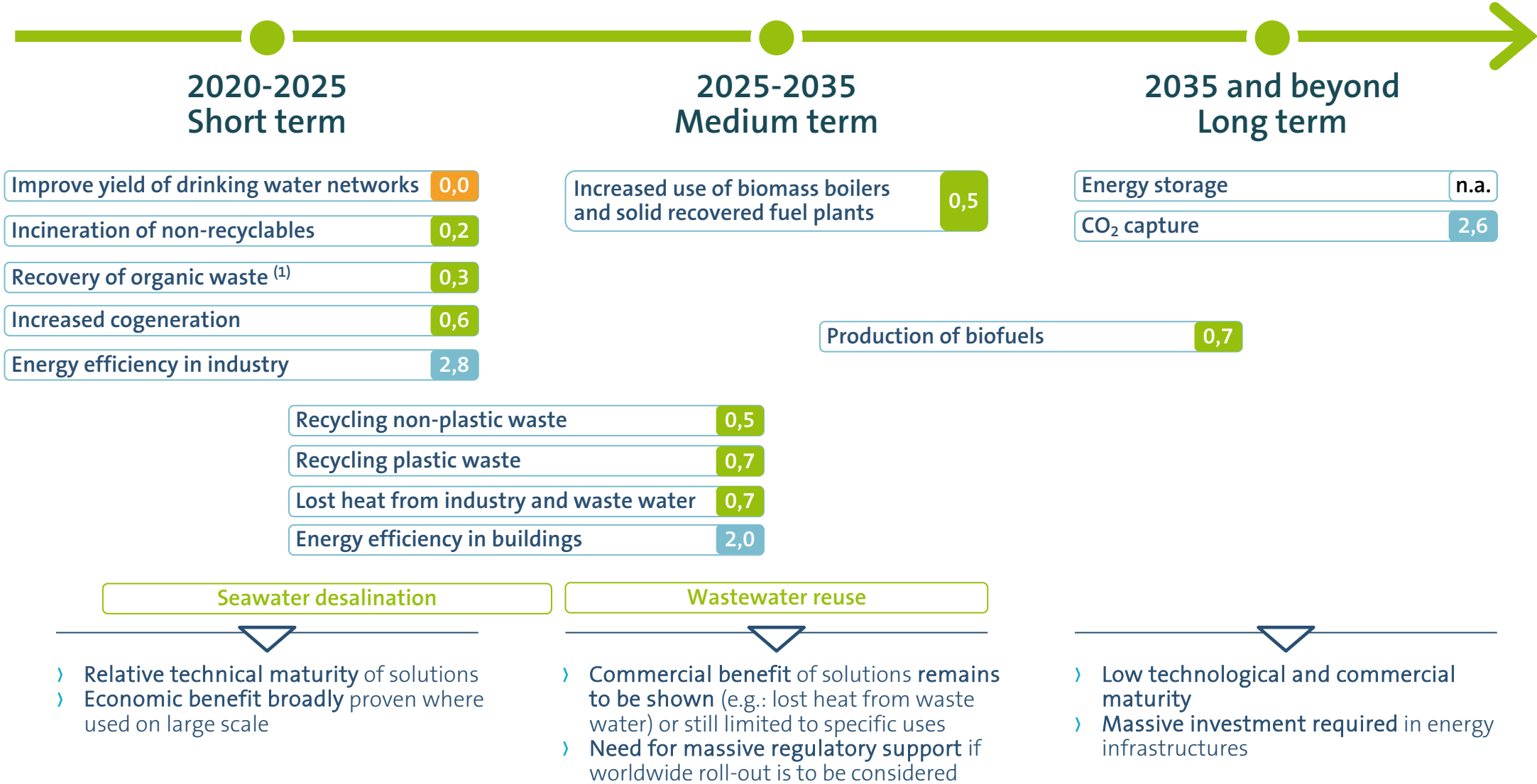
- › Seawater desalination
- › Wastewater reuse



(1) Includes solutions for anaerobic digestion of sludges from wastewater treatment plants and anaerobic digestion of organic waste (agriculture and urban)

CHRONOLOGY OF ENVIRONMENT SOLUTION ROLL-OUTS

MEANINGFUL SOLUTION ROLL-OUT



Xxx Mitigation solution
Xxx Adaption solution

Potential GHG emissions avoided [Gt CO2e / year; 2050]:

X,X Less than 0.1 Gt / year X,X 0.1 to 1.0 Gt / year X,X Over 1.0 Gt / year

(1) Includes recovery of sludges from wastewater treatment plants and organic waste as biogas (anaerobic digestion) or soil improver (fertilizer)

Source: Roland Berger; Veolia analysis