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Are Sustainable Urban Energy Systems Essential for a New Deal on Energy Access for Africa?

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The IEA works around the world to support an accelerated clean energy transition that is

enabled by real-world SOLUTIONS

supported by ANALYSIS

and built on DATA

Global Context

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- First clear signs of decoupling of CO_2 emissions and GDP
  - *Global energy-related CO2 emissions flattened in 2015 after their slowest historical increase in 2014, despite growing GDP*
  - *Renewable power capacity at record high with over 150 GW installed in 2015*
- COP21 provided a historic push for clean energy
  - *Start of a new era of collaboration: Country-based approaches preferred to top-down regulation*
  - *New goals put forward – going beyond what everyone already considered challenging when our first ETP was released in 2006*
- Growing recognition that greater innovation is essential to meet ambitious climate goals

Progress in clean energy needs to accelerate

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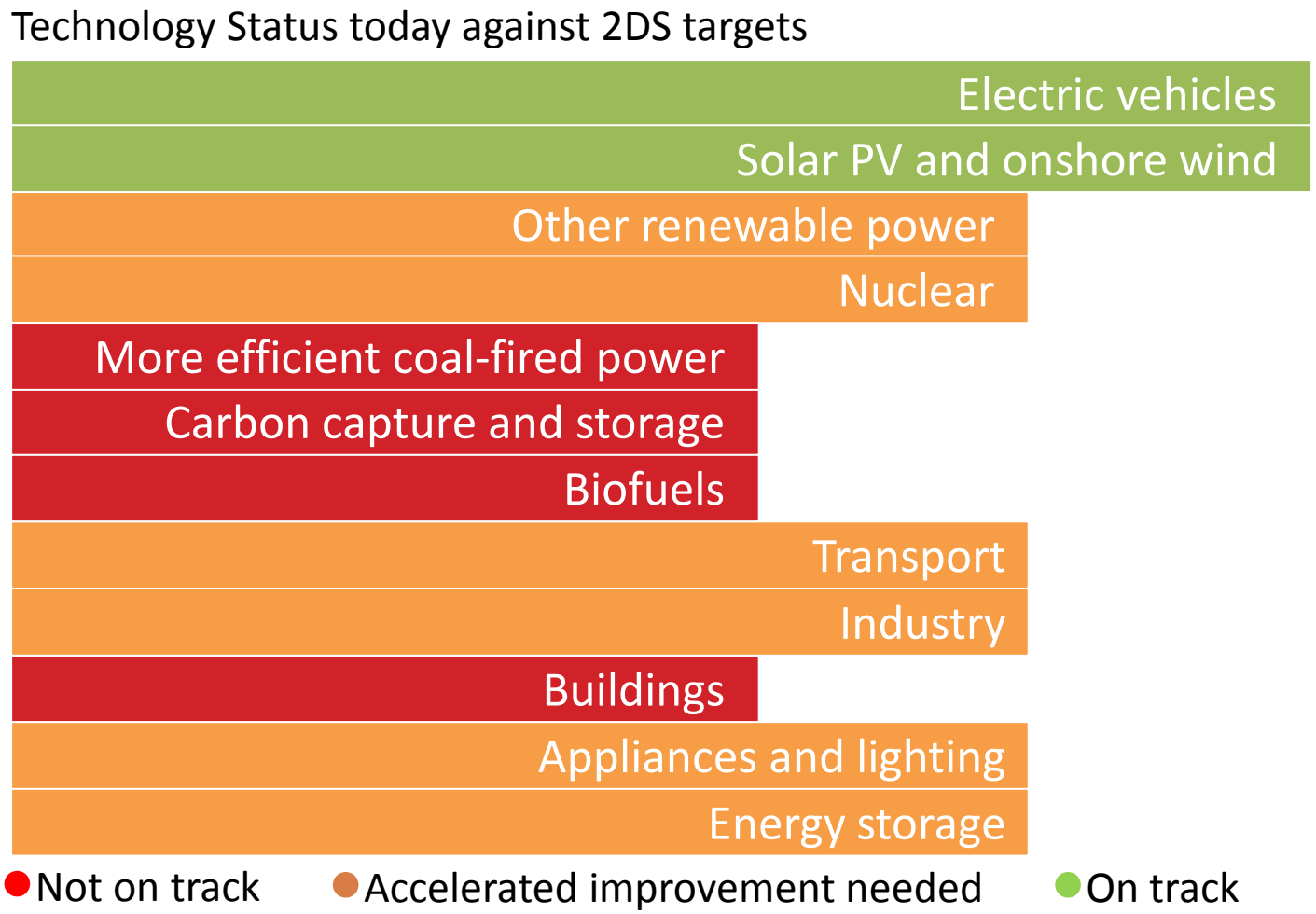

Clean energy deployment is still overall behind what is required to meet the 2°C goal, but recent progress on electric vehicles, solar PV and wind is promising

Re-thinking electricity supply

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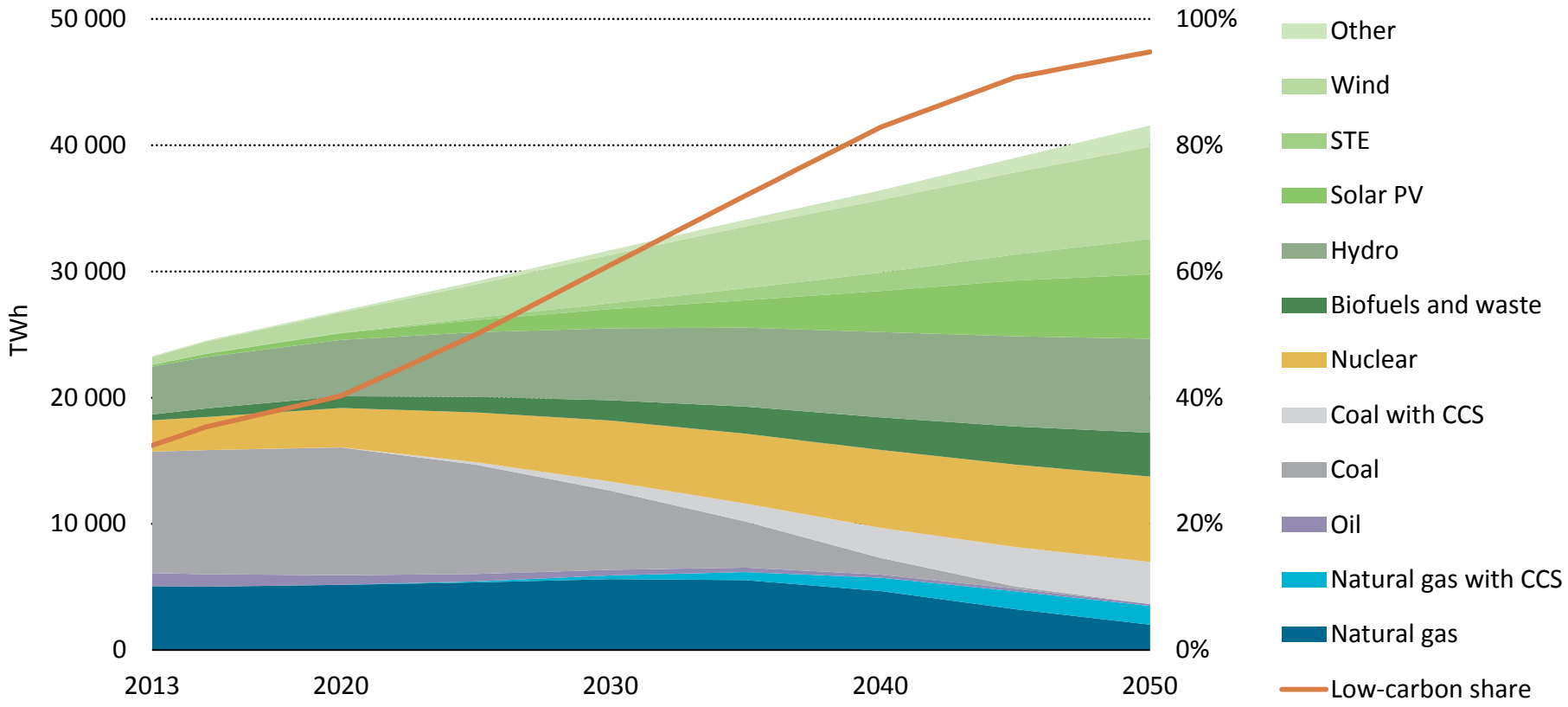

- Generation today:
  - Fossil fuels: 68%
  - Renewables: 22%
- Generation 2DS 2050:
  - Renewables: 67%
  - Fossil fuels: 17%

Buildings efficiency must be ramped up

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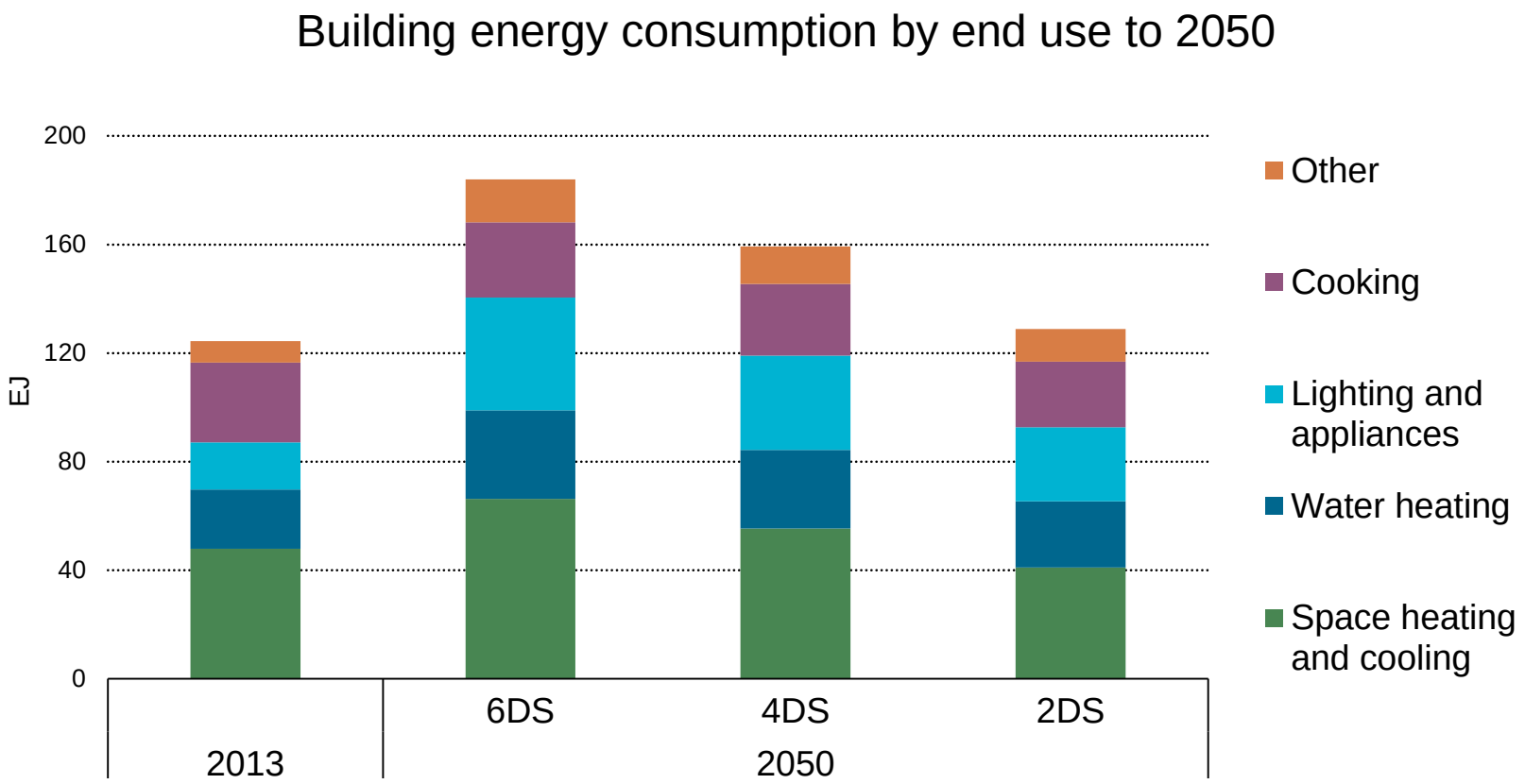


Building energy use could increase 50% without strong action to improve energy efficiency.

Sub-Saharan Context – 2014 Energy Outlook

- Energy demand in Sub-Saharan Africa grew by around 45% from 2000 to 2012, but accounts for only 4% of global energy demand (despite having 13% of global population)
- Despite many positive efforts; more than 620 million people (two-thirds of population) are without access to electricity
- Domestic energy reforms gaining speed, but two-thirds of energy investment since 2000 went to develop resources for export
- Only a handful of countries have electrification rates above 50%

2014 Energy Outlook – Looking Ahead

- Energy can act as engine of inclusive economic and social growth
- Under our scenario to 2040:
  - renewables account for almost half the growth in overall power supply, and for two-thirds of the mini-grid and off-grid systems installed in rural areas; overall huge potential
  - 950 million people are projected to gain access to electricity, with urban areas experiencing the largest improvement in coverage and reliability
  - Cumulative investment of more than $200 billion lowers the total without access by 15%, but leaves 530 million without electricity in 2040
  - Only 3% of total energy-related CO2 emissions by 2040, but on the front line when it comes to potential impacts of changing climate

2014 Energy Outlook – African Century Case

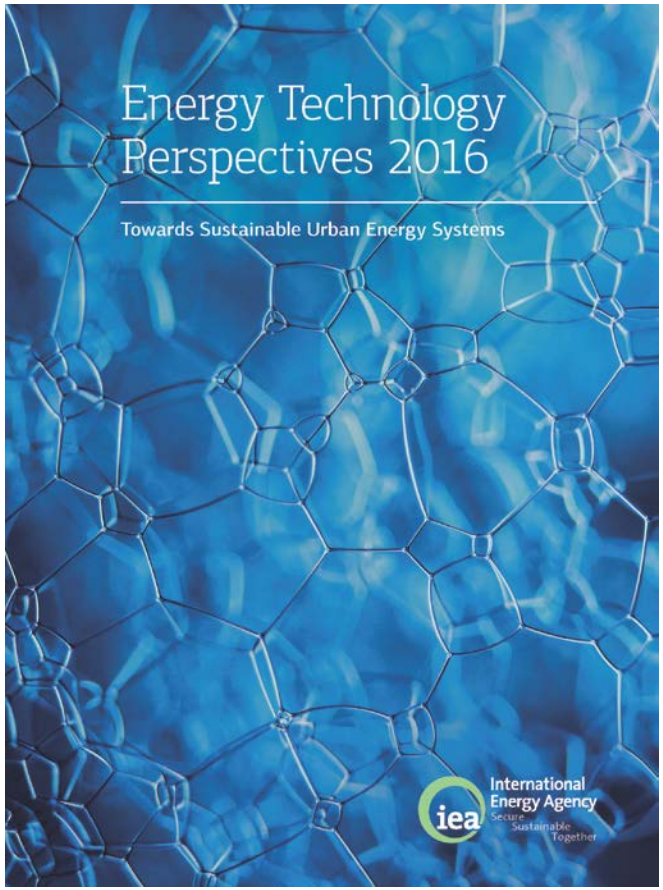
Africa Century case assesses the impact for faster movement in three key areas:

1. **An upgraded power sector; reducing power outages by half and achieving universal access in urban areas**
2. **Deeper regional cooperation; expanding markets and unlocking a greater share of the continents' hydropower potential**
3. **Better management of resources and revenues; more efficiency and transparency in financing essential infrastructure**

ETP2016: Towards Sustainable Urban Energy Systems

ETP 2016

- The Urban Energy Challenge
- Energy-efficient Buildings in the Urban Environment
- Sustainable Urban Transport
- Energy Supply in Cities
- Policy and Finance Mechanisms for Urban Areas



Importance of Urban Areas

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- Urban areas will shape the energy future
  - *They currently account for 80% of global GDP, 65% of energy demand and 70% of energy-related CO_2 emissions*
  - *Current urban development trends in Developing Asia would eat up half of the world's CO_2 budget of the 2DS by 2050*
  - *Sustainable urban energy planning could save 1900 Mtoe and save 50 trillion USD in energy bills to urban customers by 2050*

Action in cities will be critical

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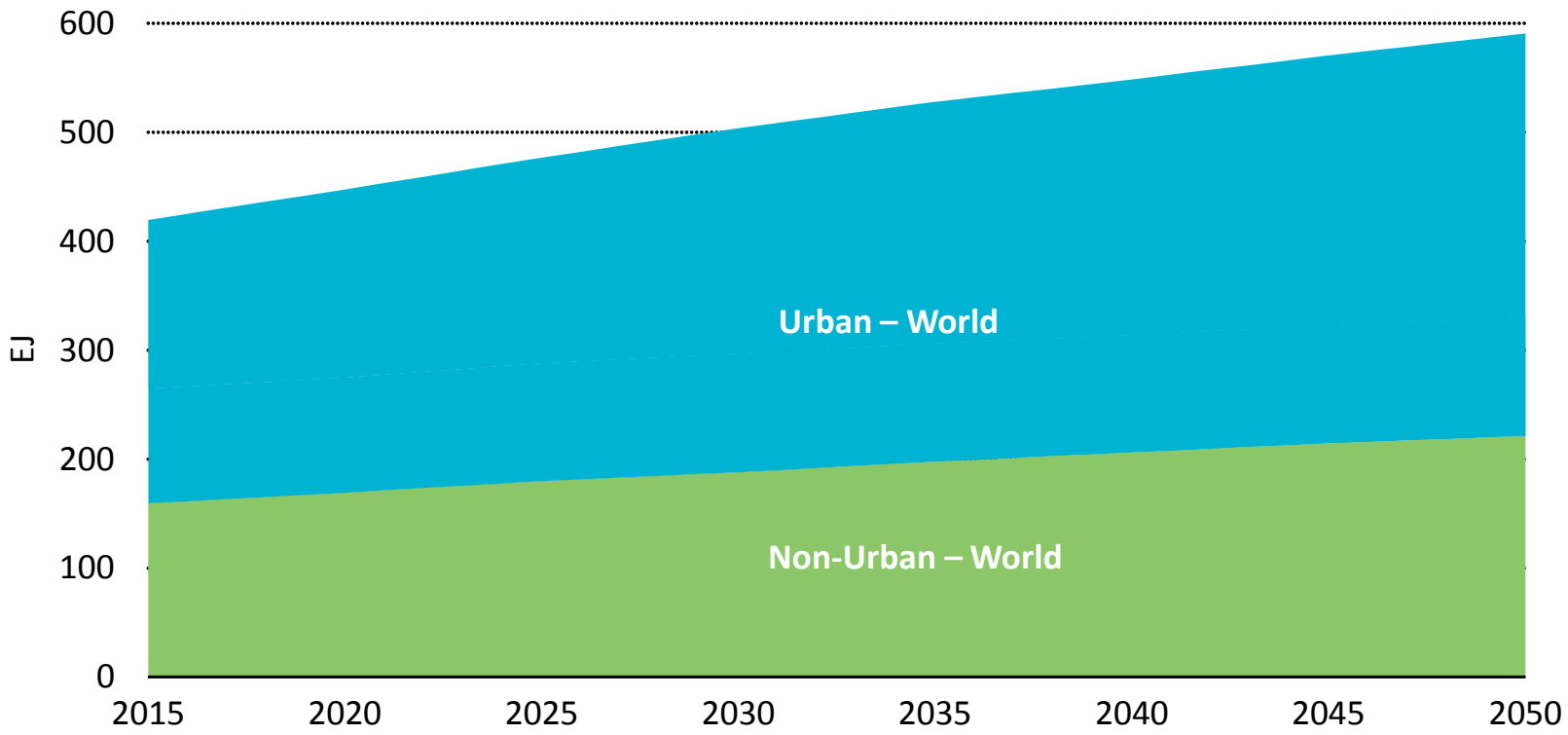
Final energy demand in the 4DS



Action in cities will be critical, notably in emerging and developing economies

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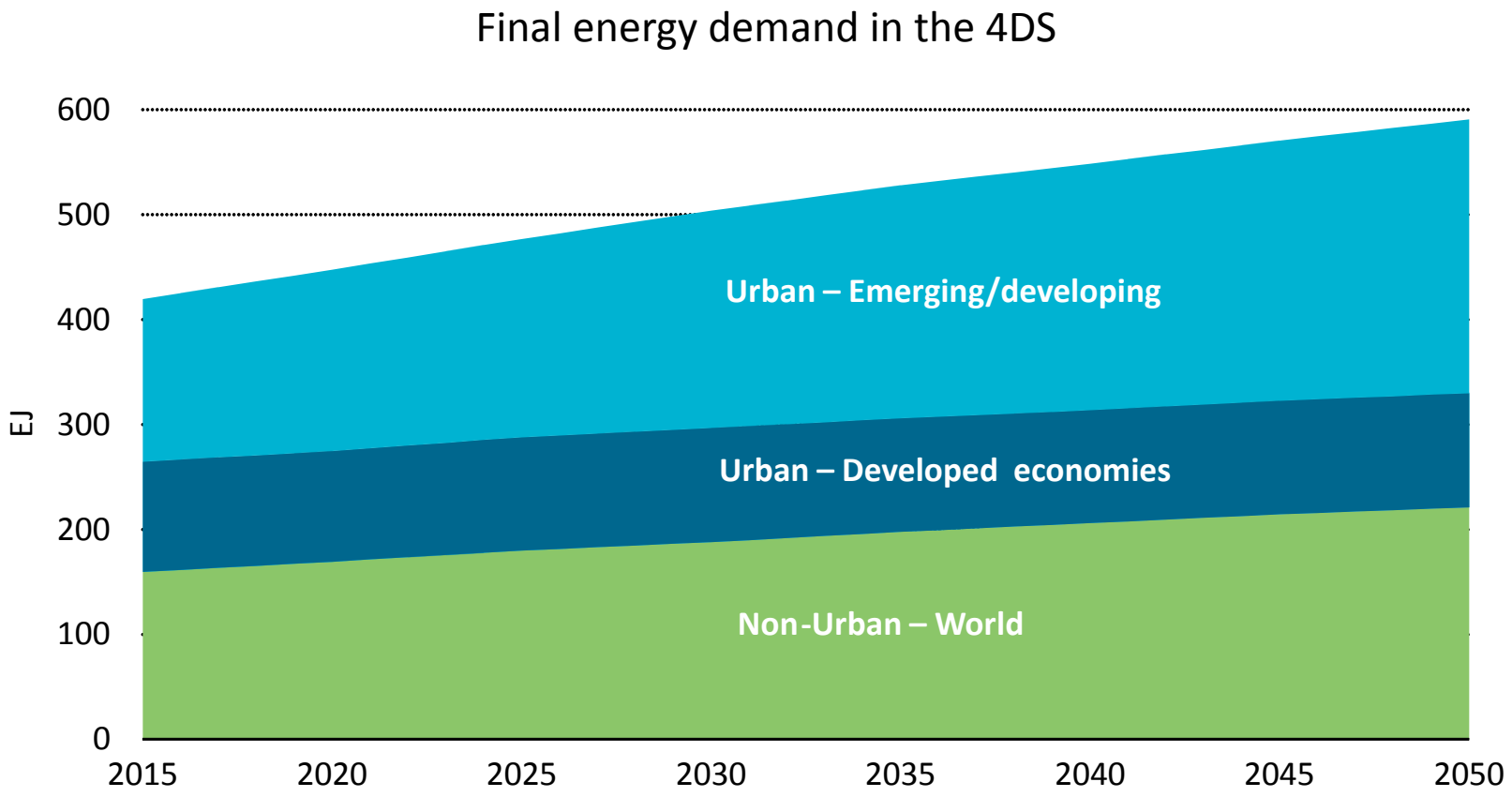

Two-thirds of the growth in global energy demand to 2050 comes from cities in emerging and developing economies

Cities are key to carbon abatement

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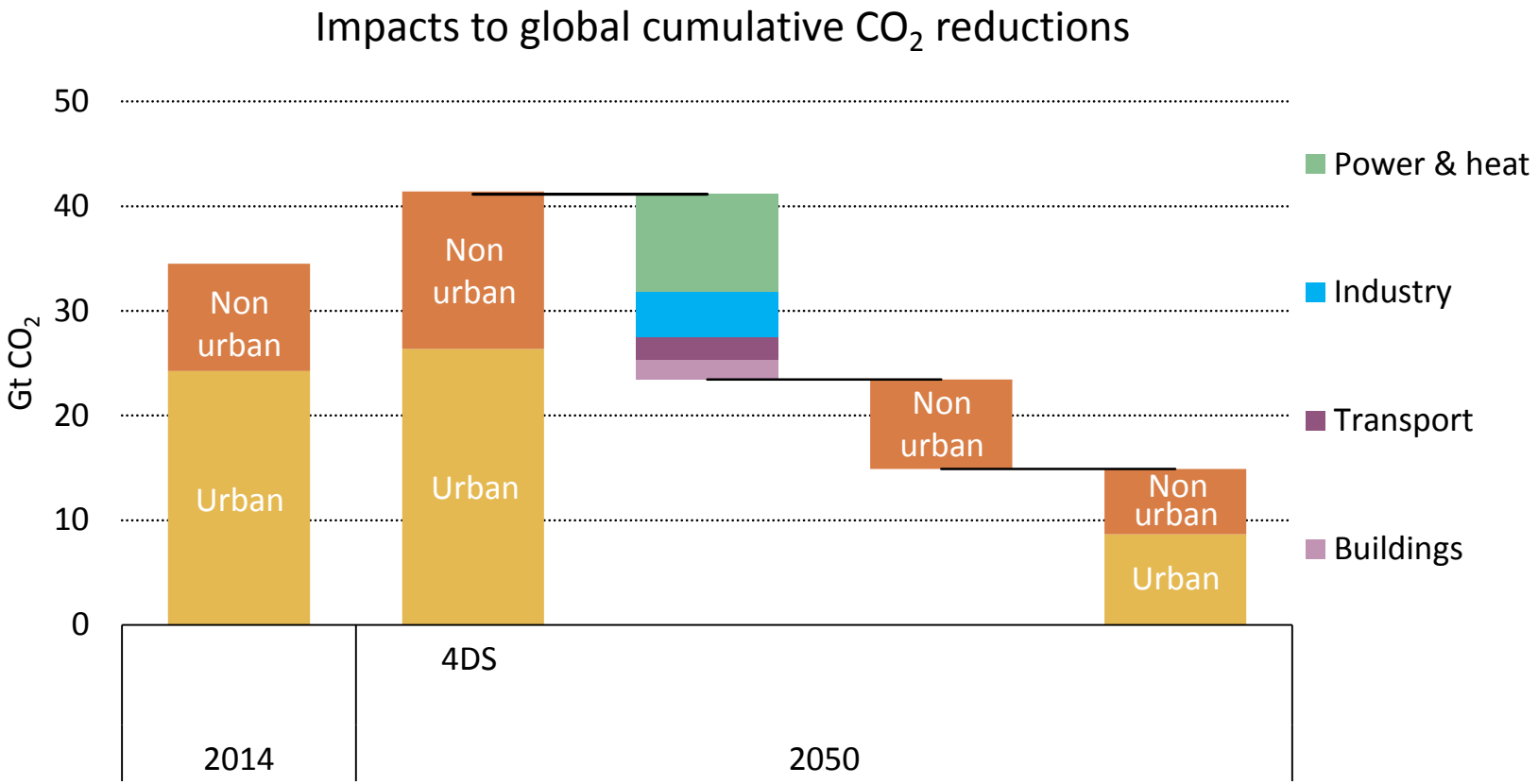

Cities represent 70% of the cost-effective CO_2 abatement potential by 2050

Heating and cooling: the elephant in the room

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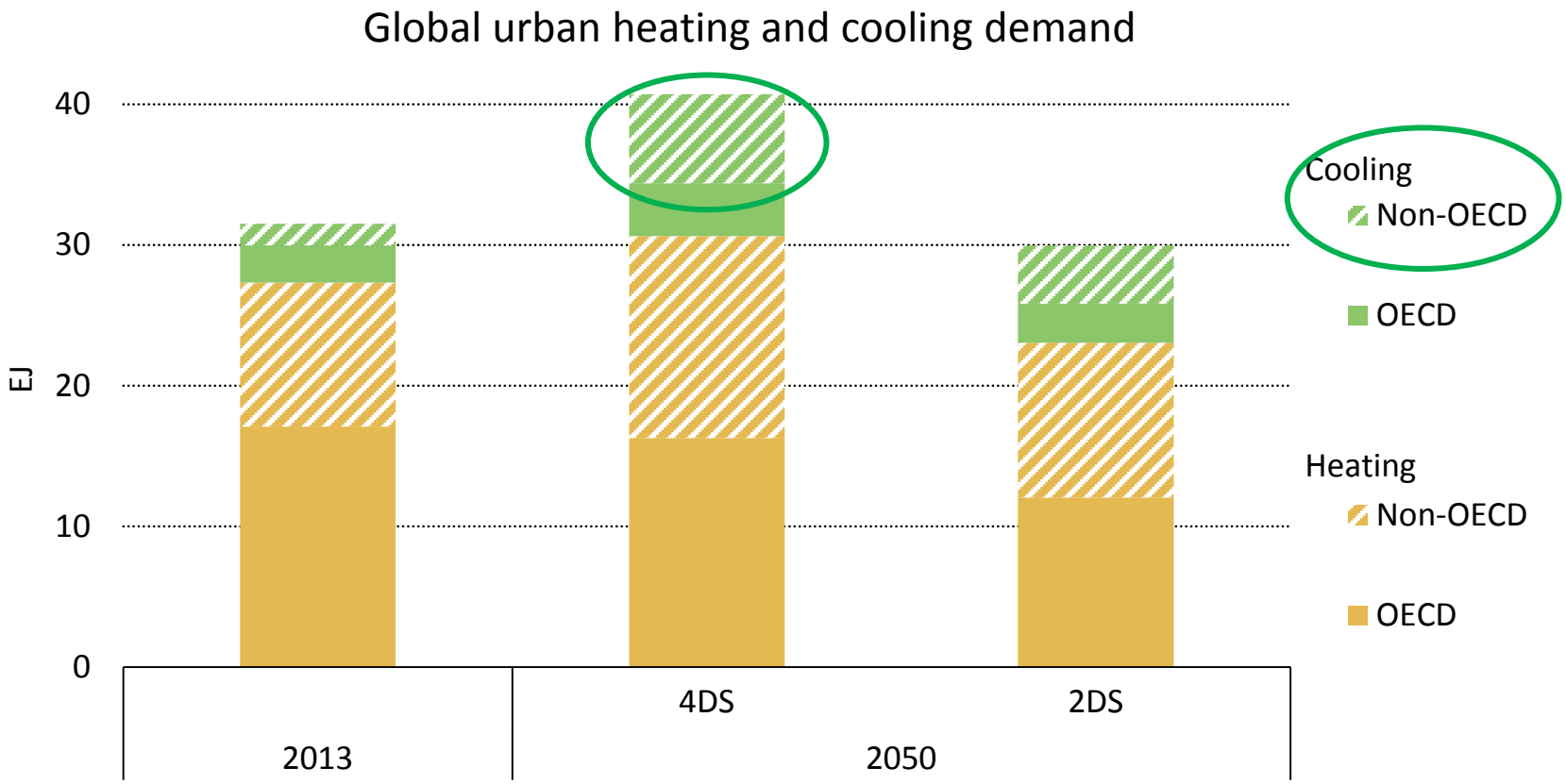

Heating and cooling energy demand in cities can be reduced by 25% without compromising thermal comfort, particularly cooling in emerging economies

Sustainable transport systems: a cheaper way to provide service

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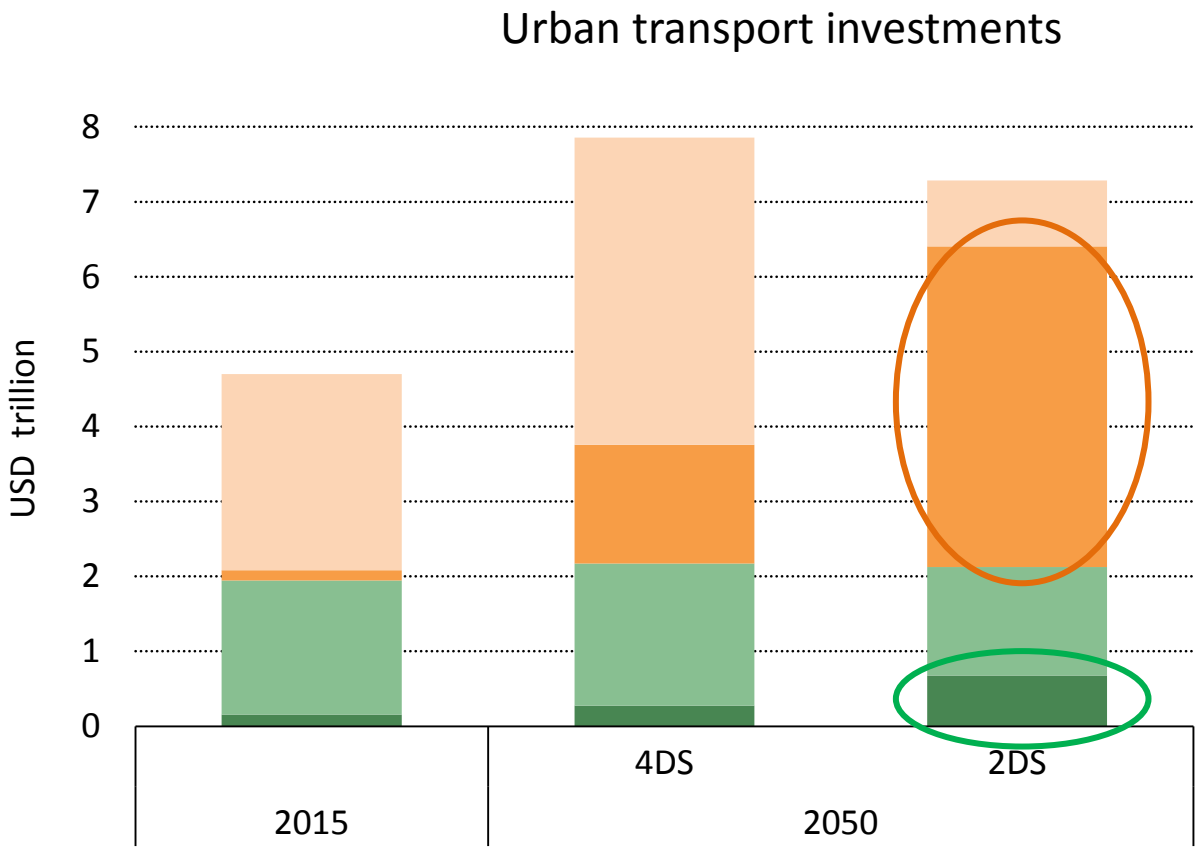

In the 2DS, by 2050 one billion cars are electric vehicles while public transport travel activity more than doubles

Locking-in sustainable new urban infrastructure, unlocking existing assets

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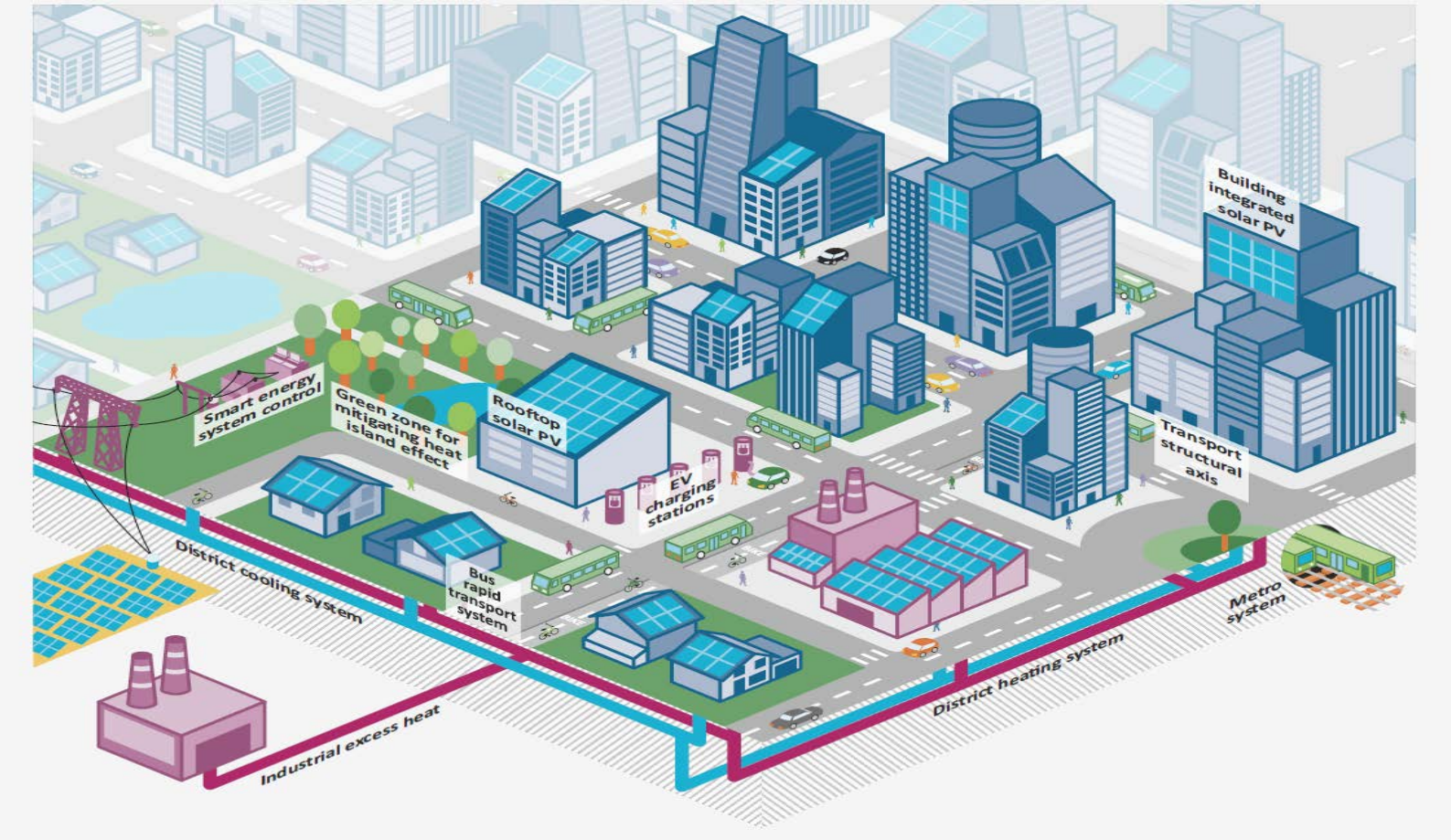

Urban forms can lock-in the energy system of cities in either inefficient or sustainable energy use patterns for decades.

Local and national actions can make the low-carbon transition possible

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Leveraging all solutions to urban energy sustainability requires strong private and public action both at local and national levels