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The Role of the Circular Economy in the Future of Fossil Fuels

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Sembcorp: DNA of integrated sustainable solutions



Integrated End-to-end (Energy & Environmental) Enterprise Solutions

Energy Solutions

Environmental Solutions

Urban Development Types & Urban Solutions

Gas

Centralised Power Generation

Renewables & Storage

Distributed Energy Solutions

Water and Wastewater Management

Solid Waste Management

- Pipeline gas & LNG importation, marketing and optimisation
- Regasification infrastructure development

- Utility-scale power generation
- Utility-scale combined heat and power
- Cogeneration and tri-generation (power, cooling and heating solutions)

- Utility-scale ground-mounted and floating solar power generation
- Commercial & Industrial rooftop solar power generation
- Utility-scale wind power generation
- Energy storage systems

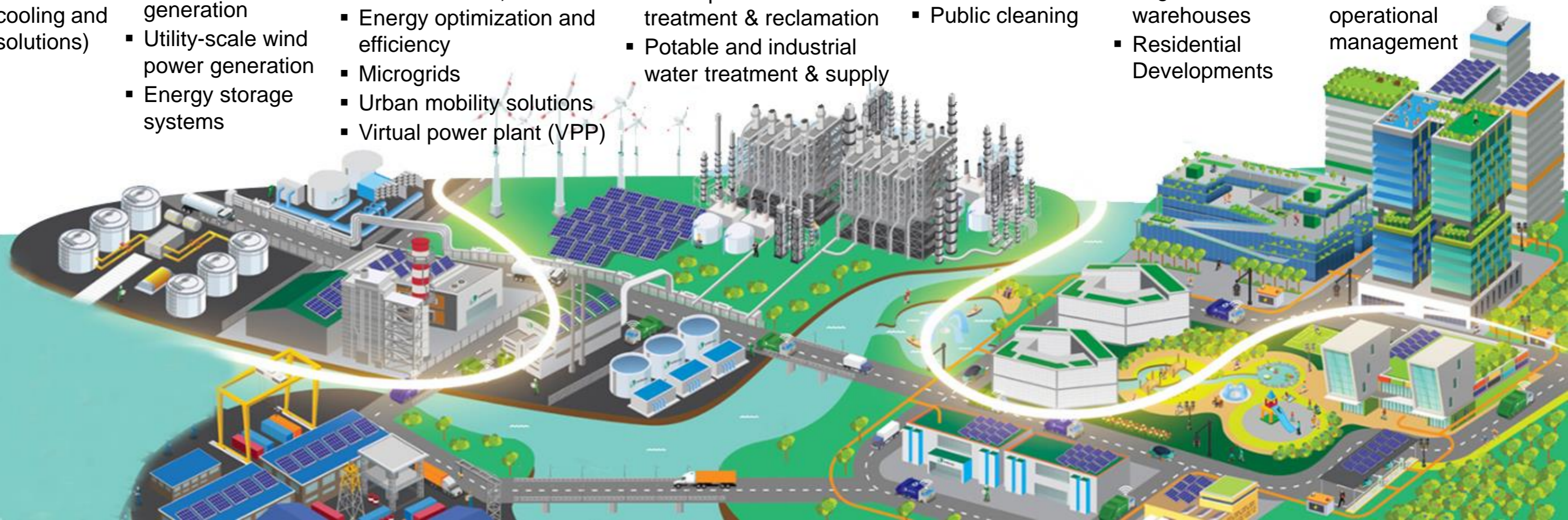
- Distributed energy generation
- Grid ancillary services
- Demand response
- Electricity retail (including green attributes such as RECs & CERs)
- Energy optimization and efficiency
- Microgrids
- Urban mobility solutions
- Virtual power plant (VPP)

- Closed loop industrial water management
- Industrial wastewater treatment & reclamation
- Zero liquid discharge
- Seawater desalination
- Municipal wastewater treatment & reclamation
- Potable and industrial water treatment & supply

- Waste management & logistics
- Recycling services
- Waste-to-resource
- Public cleaning

- Integrated townships industrial parks
- High-tech parks
- Business hubs
- Logistic warehouses
- Residential Developments

- Industry positioning & investment promotion
- Master planning & urban design
- Infrastructure & land development
- Asset, facilities & operational management



India's commitments to sustainability are increasing



India's INDC commitments

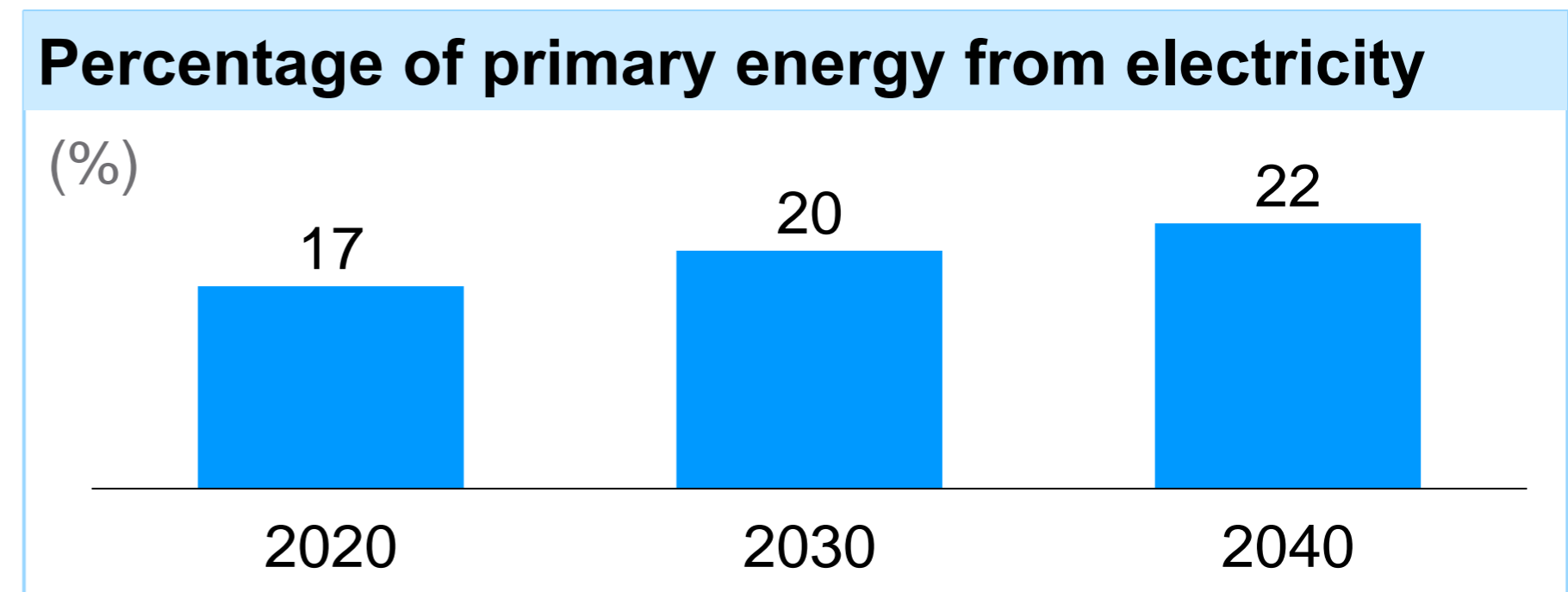
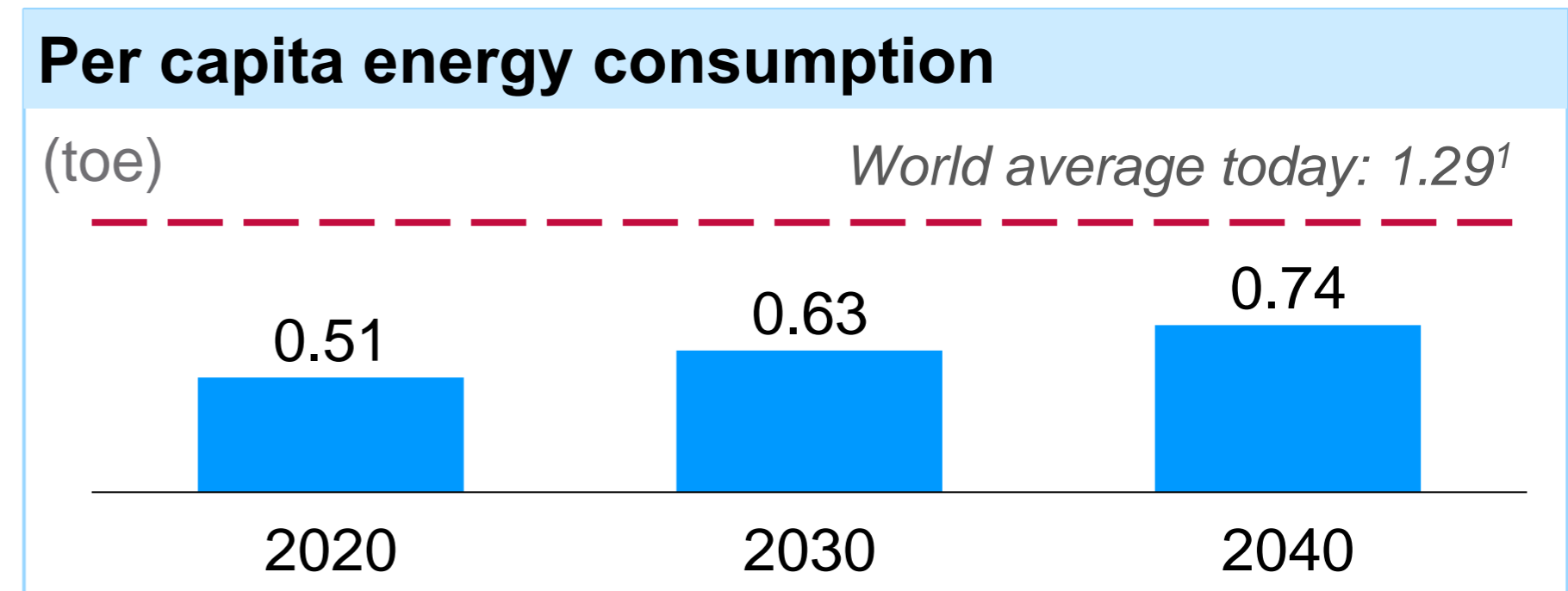
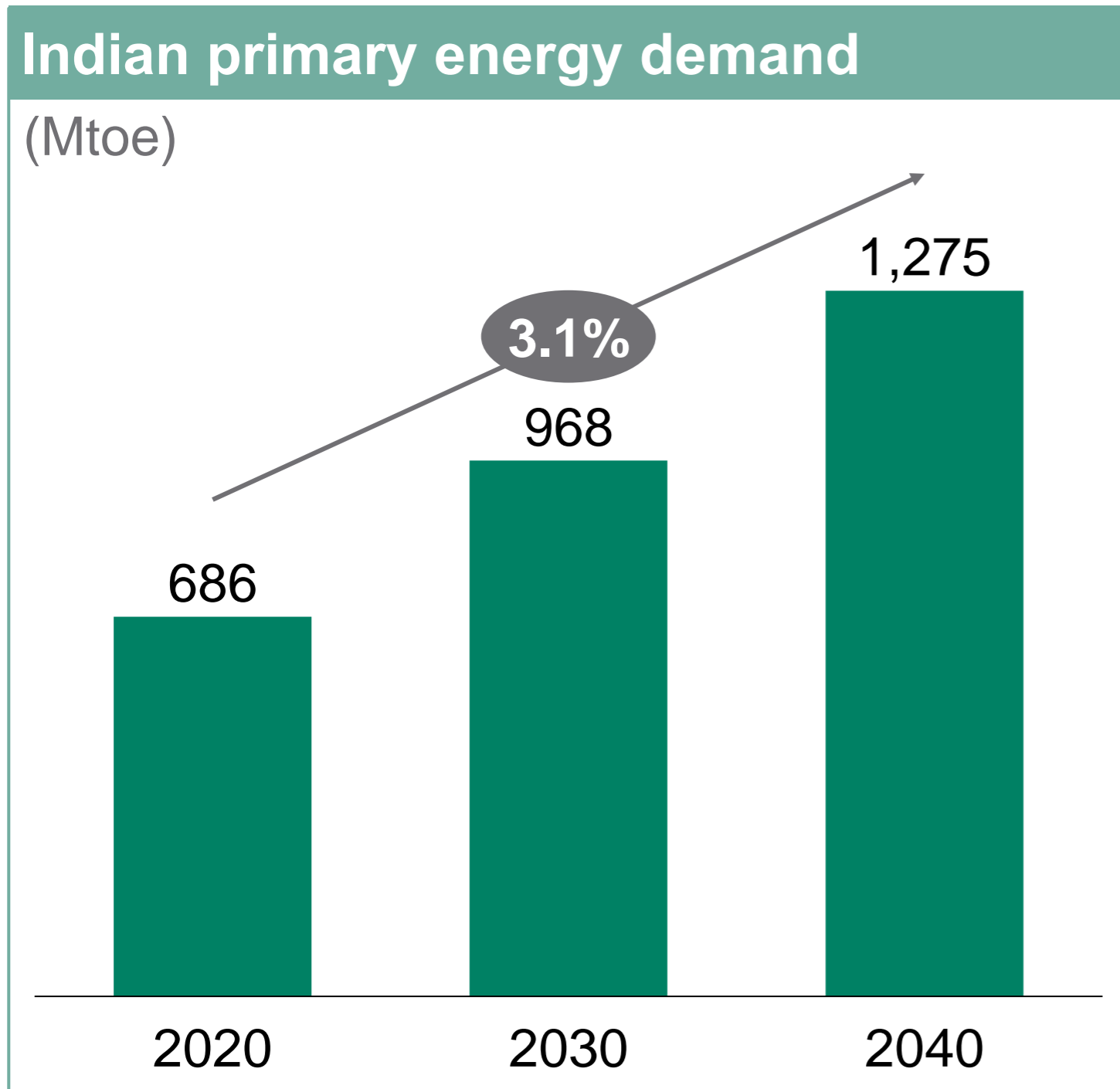
- Reduce emissions intensity by 33-35% by 2030, below 2005 levels
- Install 40% of total electricity capacity from non-fossil fuel-based energy sources
- Create an additional carbon sink of 2.5 to 3 bn tonnes of CO₂ through additional forests by 2030

Seven pillars of India's energy plan

- 1 Accelerating a gas-based economy
- 2 Cleaner use of fossil fuels
- 3 Domestic sources to drive bio-fuels
- 4 Renewables target of 450 GW by 2030
- 5 Electricity to de-carbonise mobility
- 6 Emerging fuels including hydrogen
- 7 Digital innovation across energy systems

“Energy justice and sustainable growth”
- Prime Minister Narendra Modi

India's energy demand growing



Source: IEA; World Energy Outlook

1. IEA 2018 data

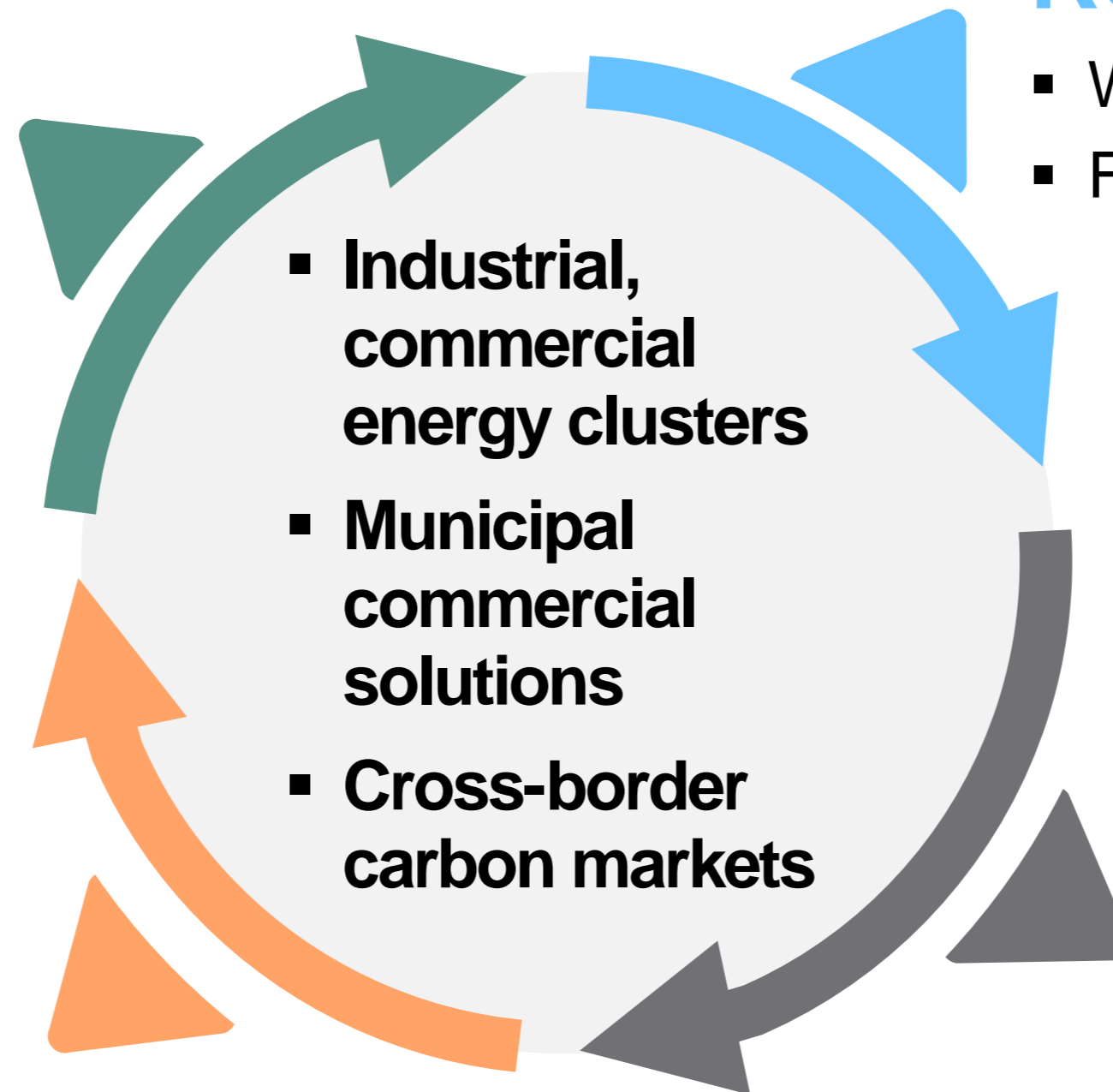
Opportunities abound, new solutions needed

Reduce

- Renewables
- Only most efficient fossil fuel assets

Remove

- Commercial, viable technology
- Viable and affordable storage
- Hydrogen
- Electric mobility



Reuse

- Wastewater recycling
- Fly ash utilisation >100%

Recycle

- Waste-to-resources / energy

