



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

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Vipul Tuli

Managing Director, Sembcorp Energy India Limited

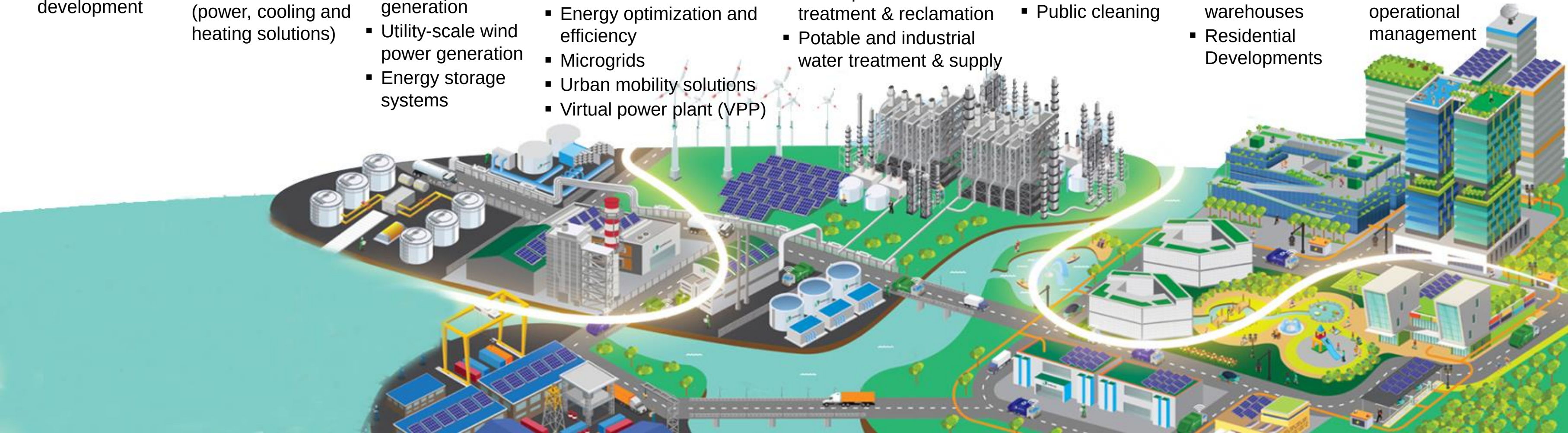


Sembcorp: DNA of integrated sustainable solutions



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

Energy Solutions				Environmental Solutions		
Gas	Centralised Power Generation	Renewables & Storage	Distributed Energy Solutions	Water and Wastewater Management	Solid Waste Management	Urban Development Types & Urban Solutions
▪ 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

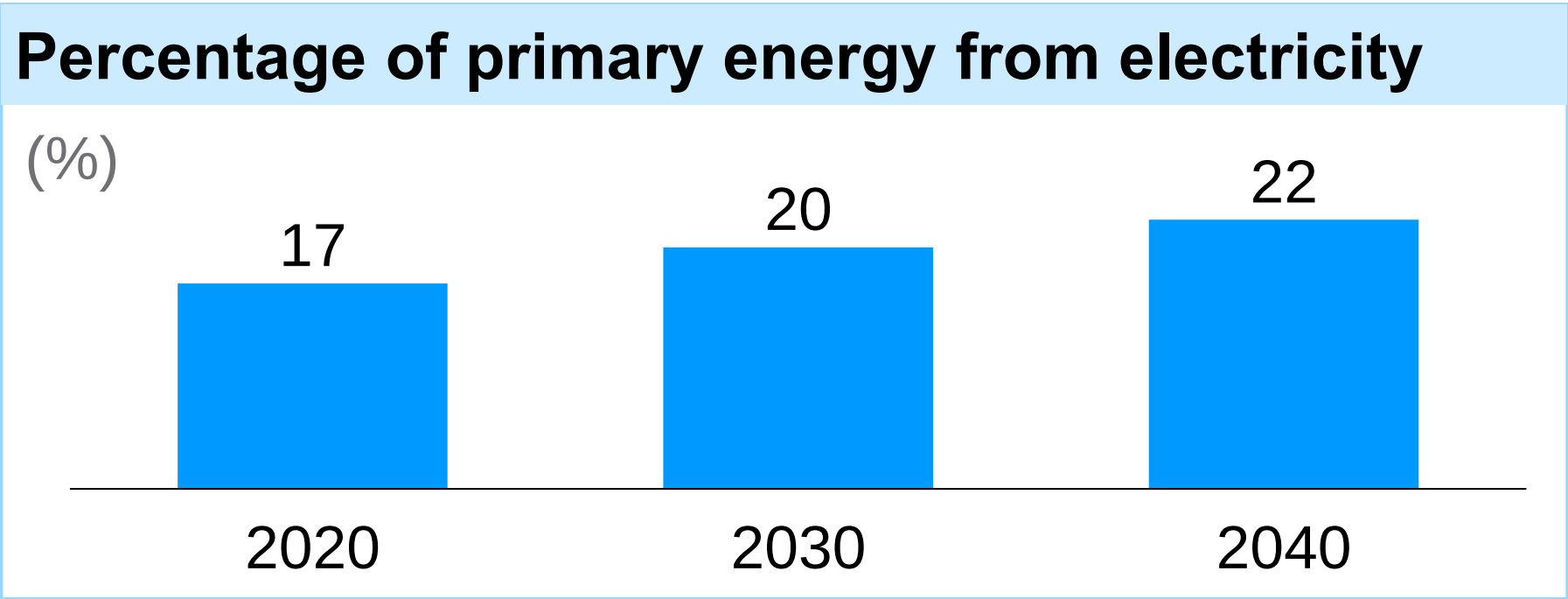
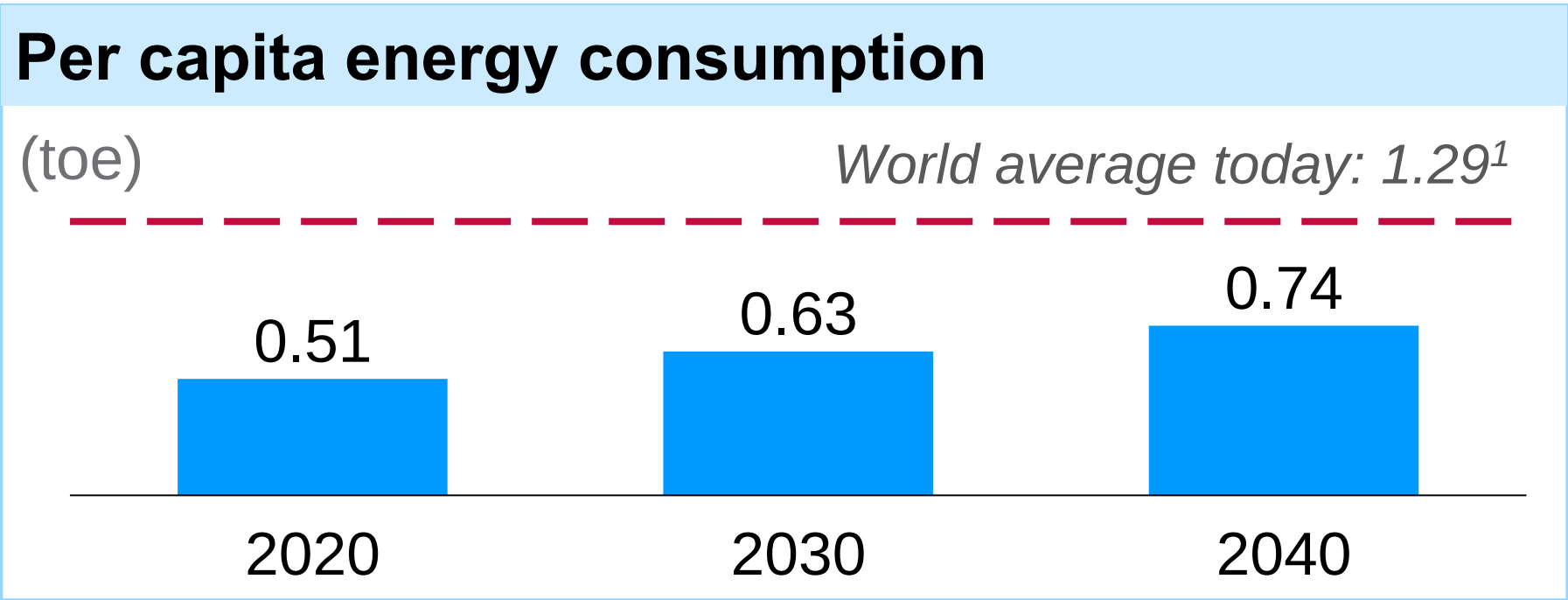
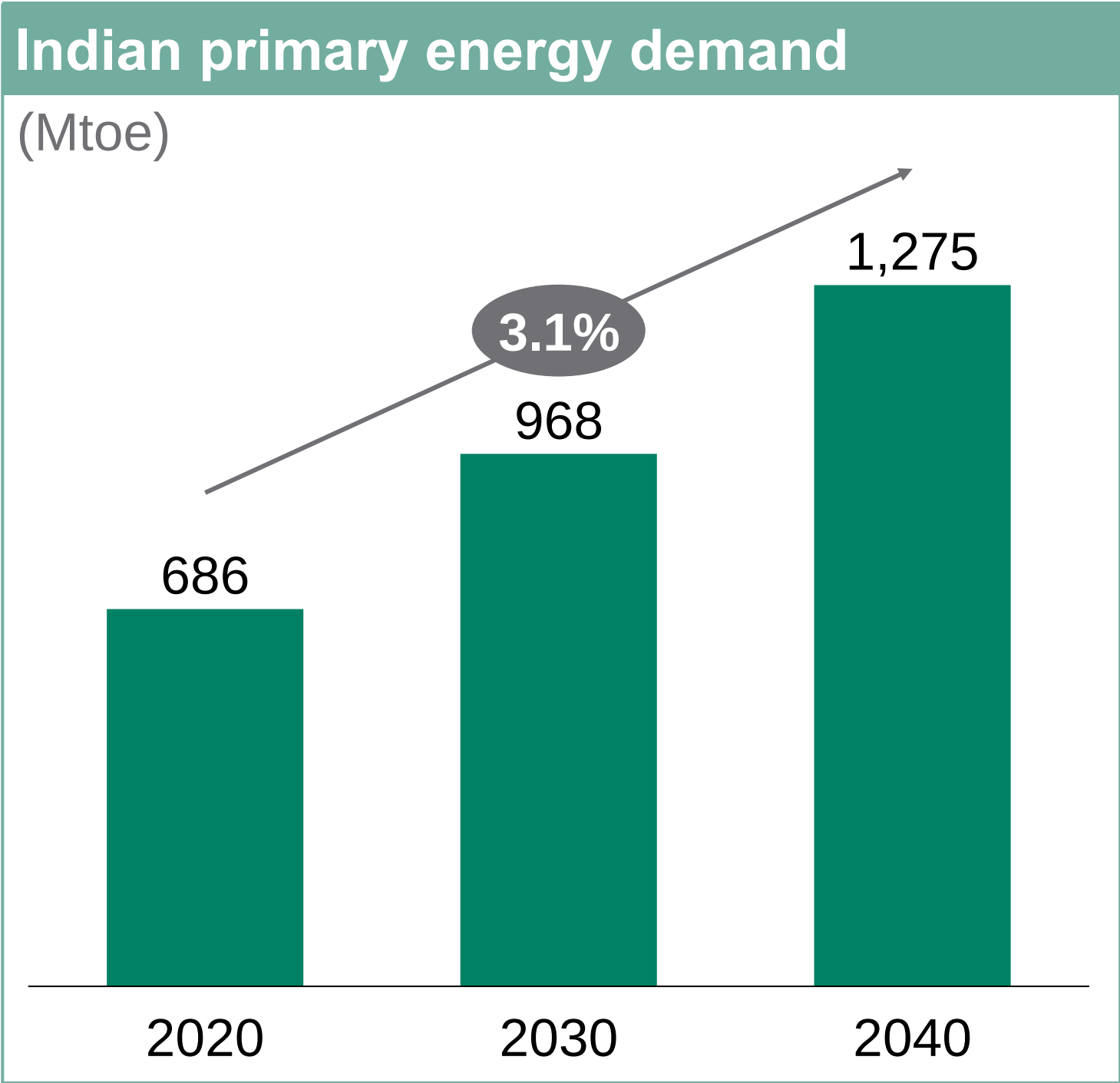
- Reduce emissions intensity by 33-35% by 2030, below 2005 levels
- Install 40% of total electricity capacity from non-fossil fuel-based energy sources
- Create an additional carbon sink of 2.5 to 3 bn tonnes of CO2 through additional forests by 2030

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

