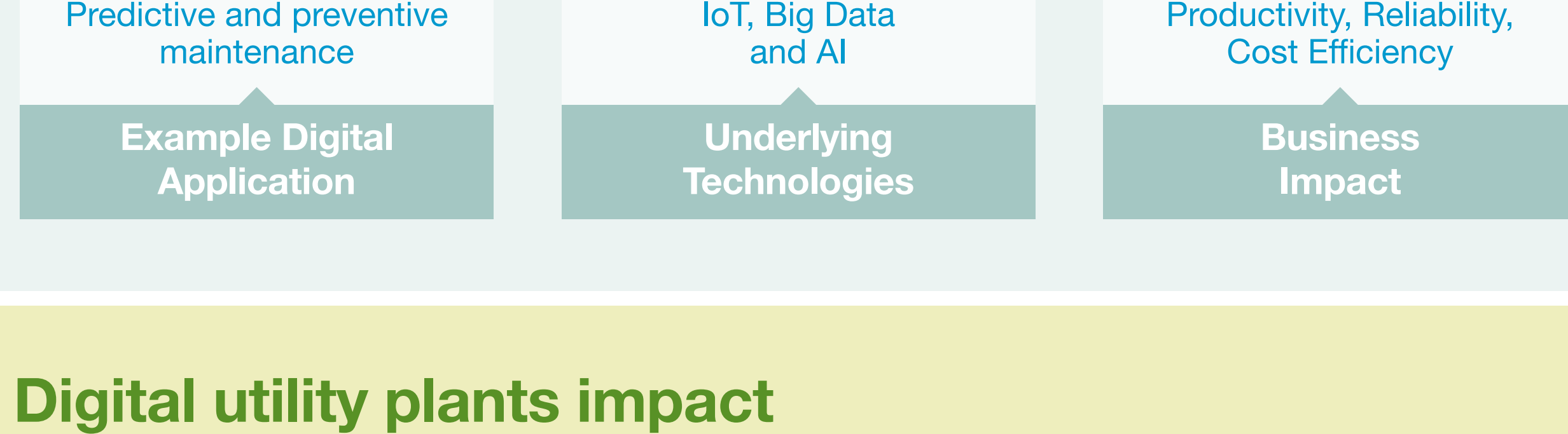


The Digital Utility Plant

Unlocking value from the digitization of utility production

What are digital utility plants?

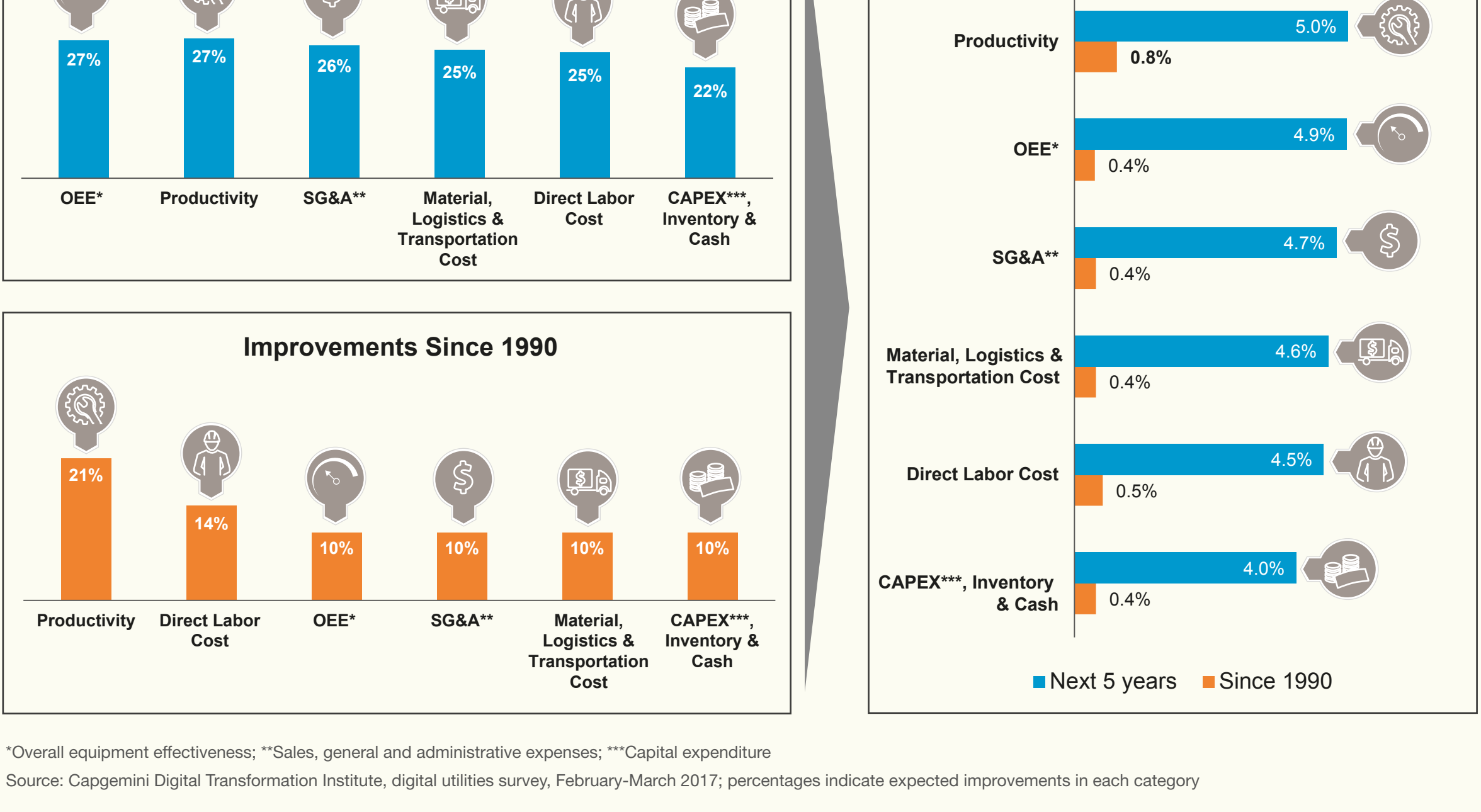
Plants that highly leverage digital applications across the utility production value chain



Digital utility plants impact all crucial areas of utility production

Operational Impact

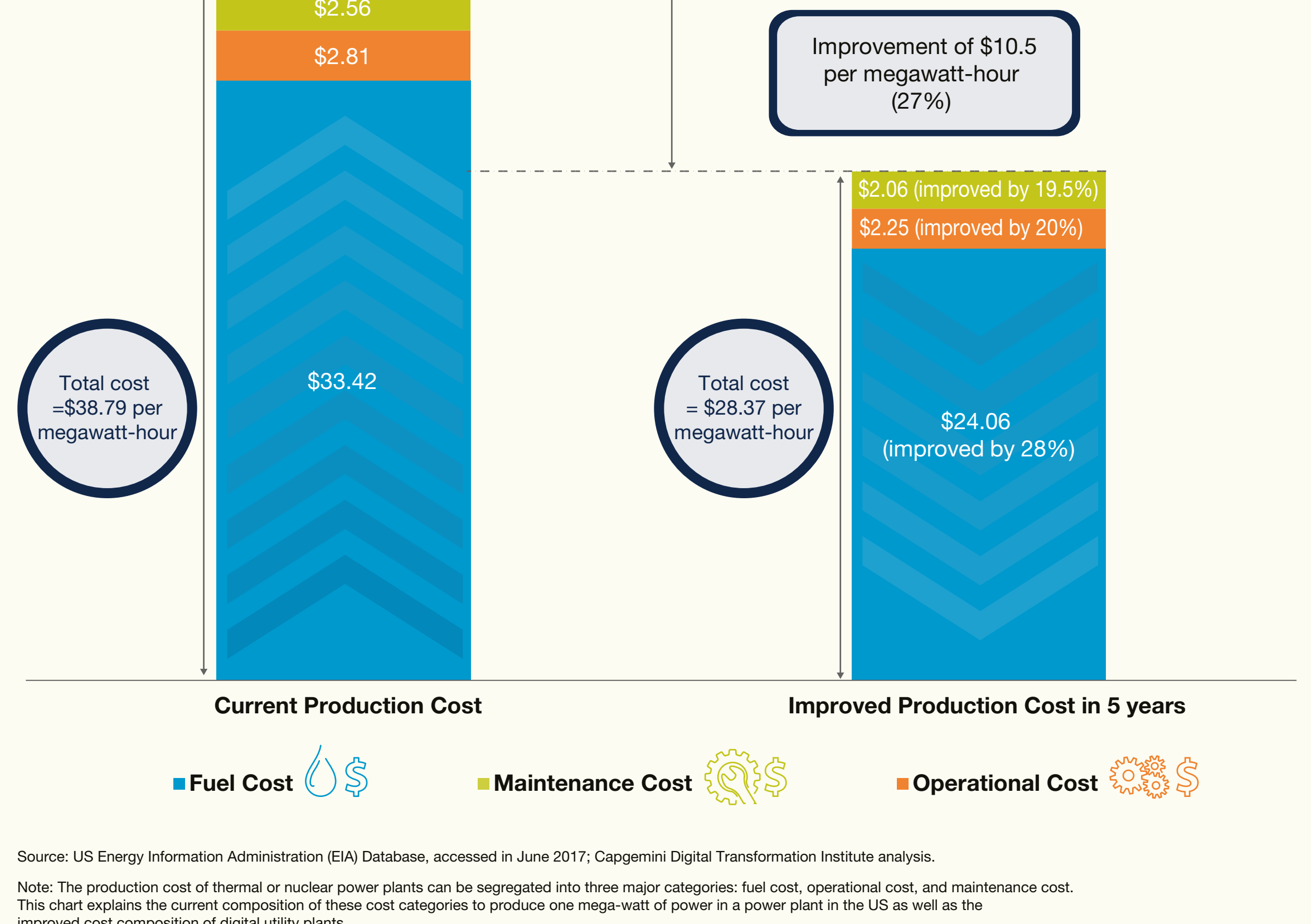
Digital plants will enable **drastic improvement of crucial KPIs** in next 5 years which are **expected to surpass the improvements since 1990**



*Overall equipment effectiveness; **Sales, general and administrative expenses; ***Capital expenditure
Source: Capgemini Digital Transformation Institute, digital utilities survey, February-March 2017; percentages indicate expected improvements in each category

Financial Impact

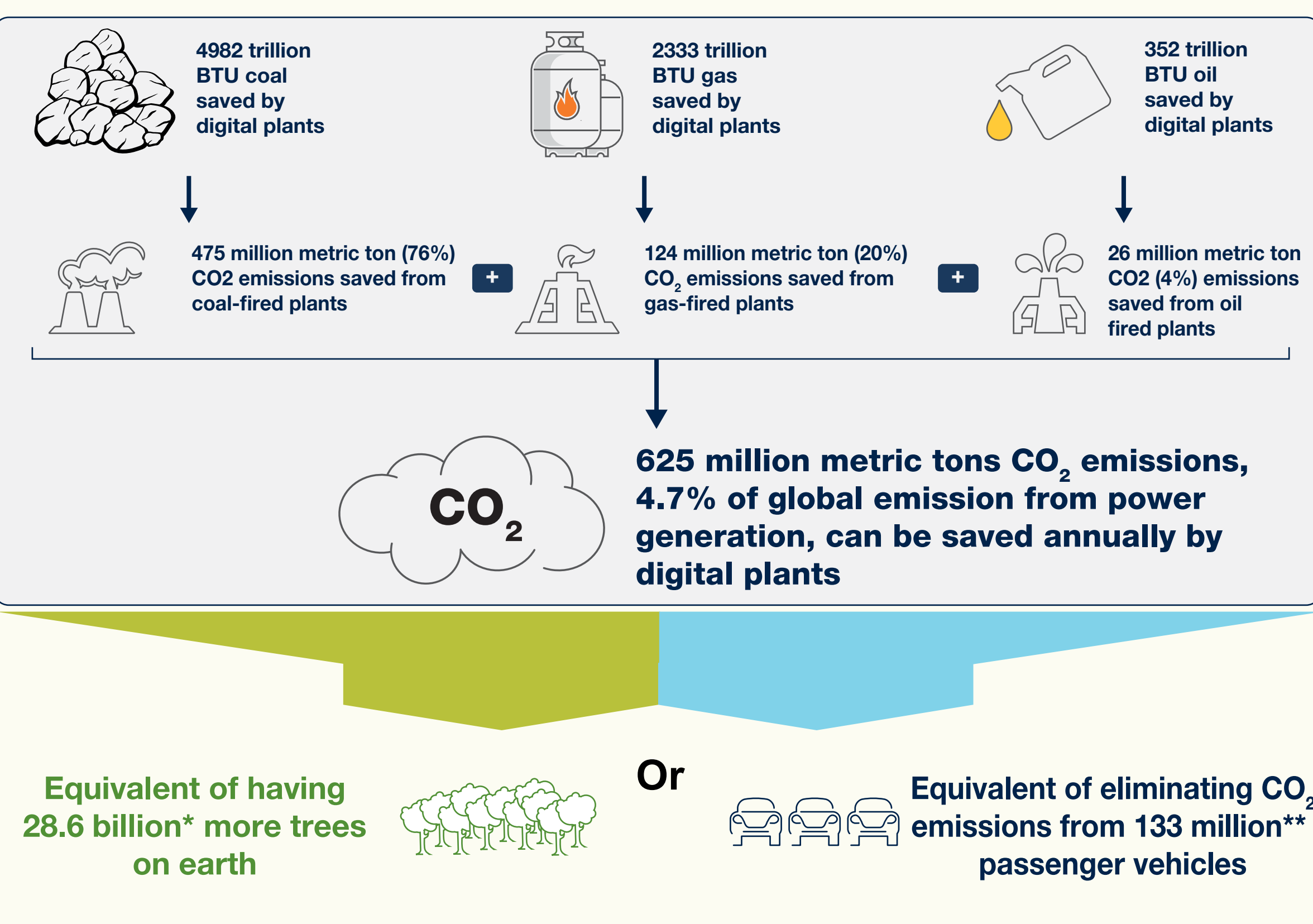
In a US based combined-cycle digital power plants, production cost can go down by **27% in next 5 years**



Source: US Energy Information Administration (EIA) Database, accessed in June 2017; Capgemini Digital Transformation Institute analysis.
Note: The production cost of thermal or nuclear power plants can be segregated into three major categories: fuel cost, operational cost, and maintenance cost. This chart explains the current composition of these cost categories to produce one mega-watt of power in a power plant in the US as well as the improved cost composition of digital utility plants.

Environmental Impact

Digital power plants can cut down **625 million metric ton CO2 emission annually by 2025**

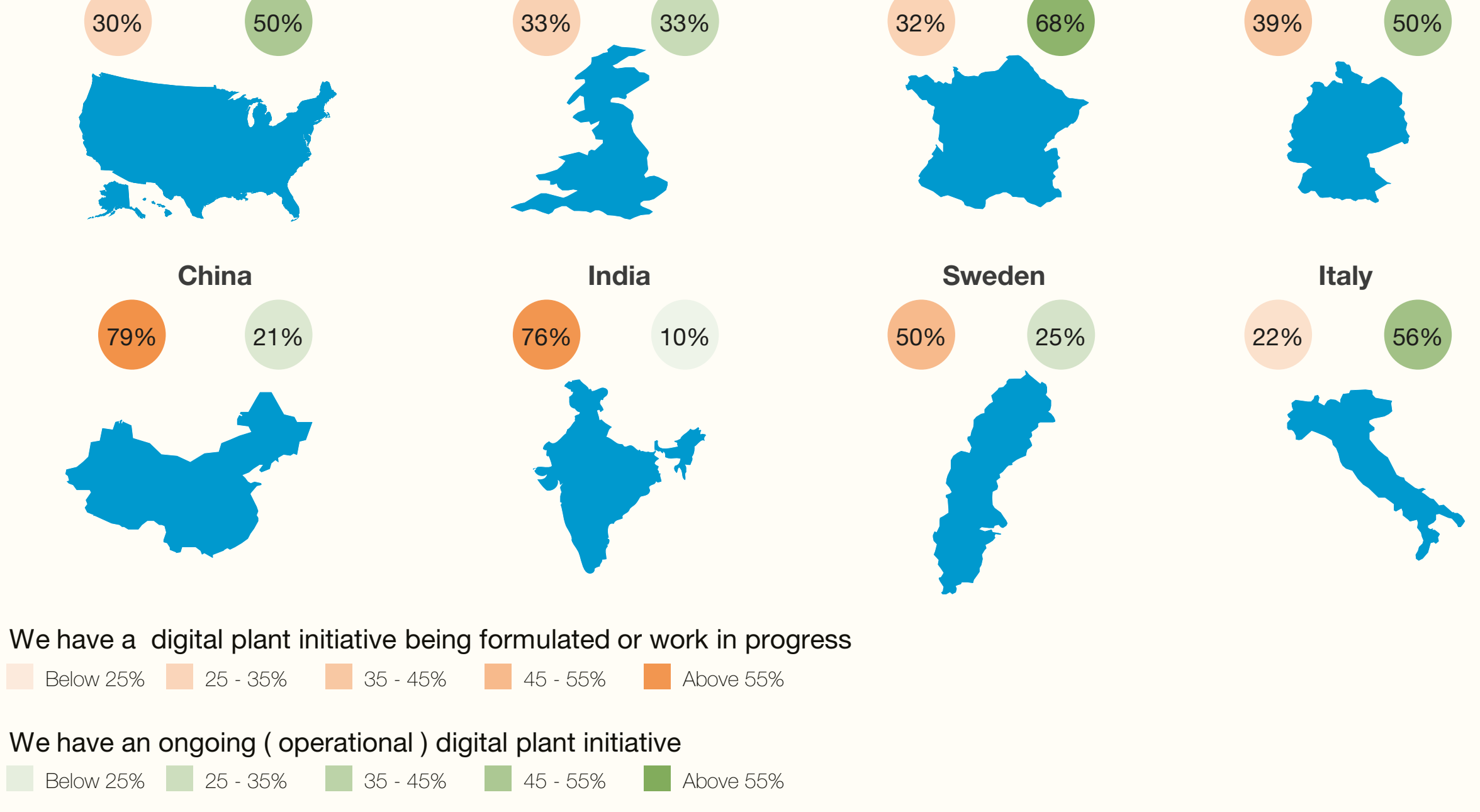


Source: Energy Information and Administration (EIA) Database, accessed in June 2017; Capgemini Digital Transformation Institute, digital utilities survey, February-March 2017; Capgemini Digital Transformation Institute analysis
*1 mature tree consumes, on average, 48 pounds or 21.78 kilograms of CO2 per year; **1 passenger vehicle emits, on average, 4.7 metric ton CO2 in a year: source United States Environmental Protection Agency Website, accessed June 2017.

Note:
To understand the impact of digital plants on global CO2 emissions related to power generation, we have applied our insights from survey data on the following data set provided by the US Energy Information and Administration (EIA).
1. The predicted share of electricity to be produced worldwide by fossil fuel
2. Average heat rate for each type of fuel (measurement of fuel that needs to be burnt to produce a unit of energy): natural gas—7.9 million BTU/MWh; coal—10.5 million BTU/MWh; petroleum—10.7 million BTU/MWh.
3. Emission rate for each type of fuel: natural gas—53.05 kg/million BTU (0.42 metric tons/MWh); coal—95.35 kg/million BTU (1.00 metric ton/MWh); petroleum—73.16 kg/million BTU (0.78 metric tons/MWh)

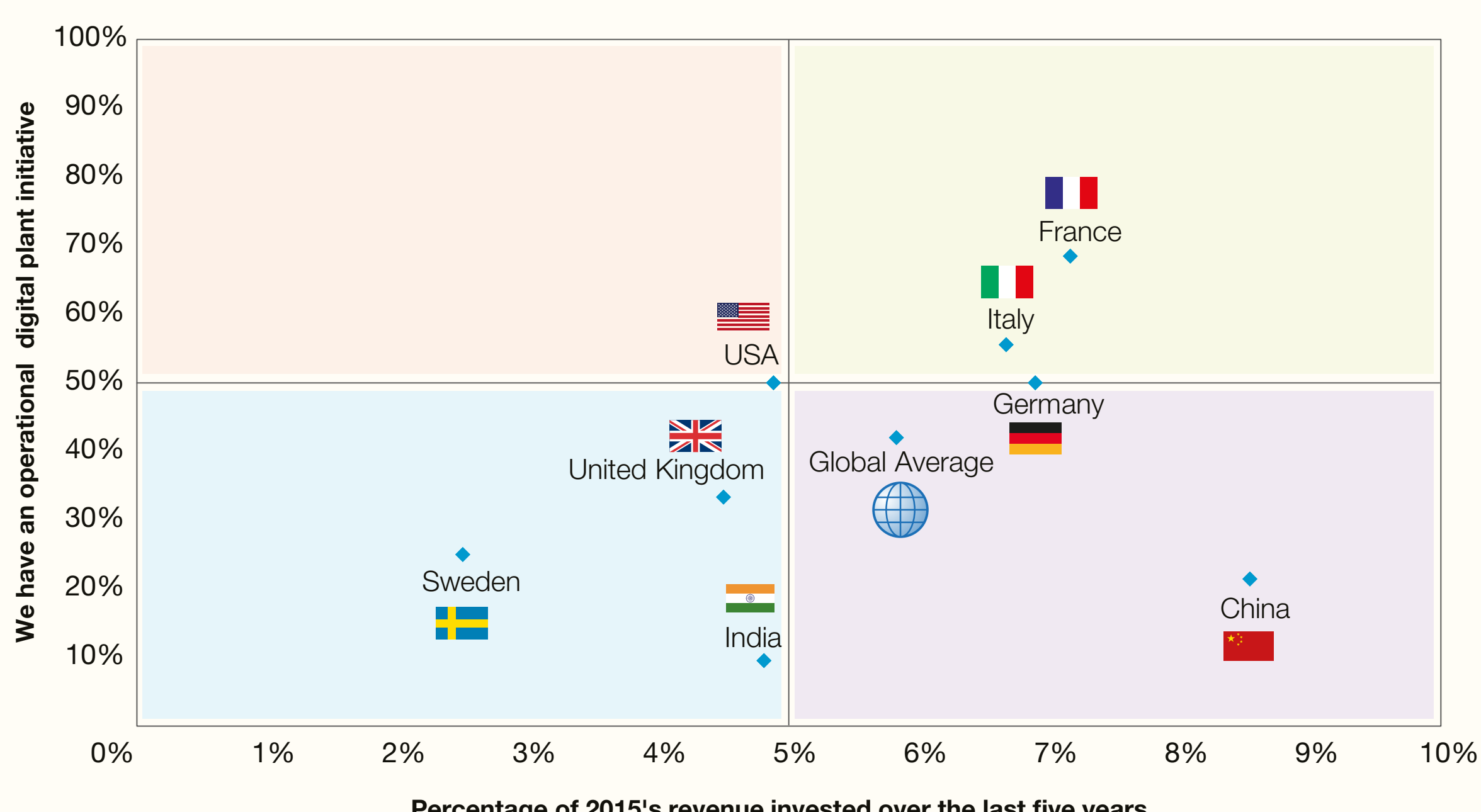
Across the world, digital plants have generated a lot of enthusiasm among utility players

Adoption: Europe and US are the early adopters while India and China plan to catch up



Source: Capgemini Digital Transformation Institute, digital utilities survey, February-March 2017; percentages indicate the share of organizations in each category

Investment: Digital plant initiatives have been seeing aggressive investments over last five years



Source: Capgemini Digital Transformation Institute, digital utilities survey, February-March 2017

However, utility companies' lack of digital maturity in operation hinders the success of digital plant initiatives

Digital Masters, utilities with higher digital maturity, will see much better improvements in crucial cost items

But, only 8% utility companies are Digital Masters in operations while 73% are Beginners at the moment

Realized Cost Savings by Digital Plant Initiatives



Source: Capgemini Digital Transformation Institute, digital utilities survey, February-March 2017; Capgemini Digital Transformation Institute analysis

How can utility companies increase their digital maturity to realize full potential of digital plants?



Source: Capgemini Digital Transformation Institute analysis

Contact us: dti.in@capgemini.com

Know more here: <https://www.capgemini.com/resources/the-digital-utility-plant-unlocking-value-from-the-digitization-of-production/>