AMERICAS ADVISORY GROUP 2021

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Transform Execution and Operation with Digital Twin technology

October 18, 2021

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slido



In your opinion, what will be the plant of the future?

ⓘ Start presenting to display the poll results on this slide.

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Competition, Digitalization & Regulation are forcing rapid change

The World has Changed



Preparing for the 'Plant of the Future' is now a current imperative

The New Normal

The Digital Twin is the digital thread that connects **people, process and assets** across the asset lifecycle enabling:

- CapEx Optimization and Efficiency
- Optimization of operating expenses
- Environmental / Sustainability
- Workforce Safety and Agility
- Integration of the Value Chain

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We power your agility through rapid market transformation

Market environment

- Fluctuating commodity supply/demand
- Competition and market evolution
- Environment, society, governance considerations
- Geopolitical change
- Generational changes and pandemic
- Accelerated digital transformation

Imperatives

- Capital expenditure and time constraints
- Operational efficiency and agility to drive profitability
- Asset reliability and availability
- Enhance energy efficiency and sustainability
- Empowering the digital connected worker

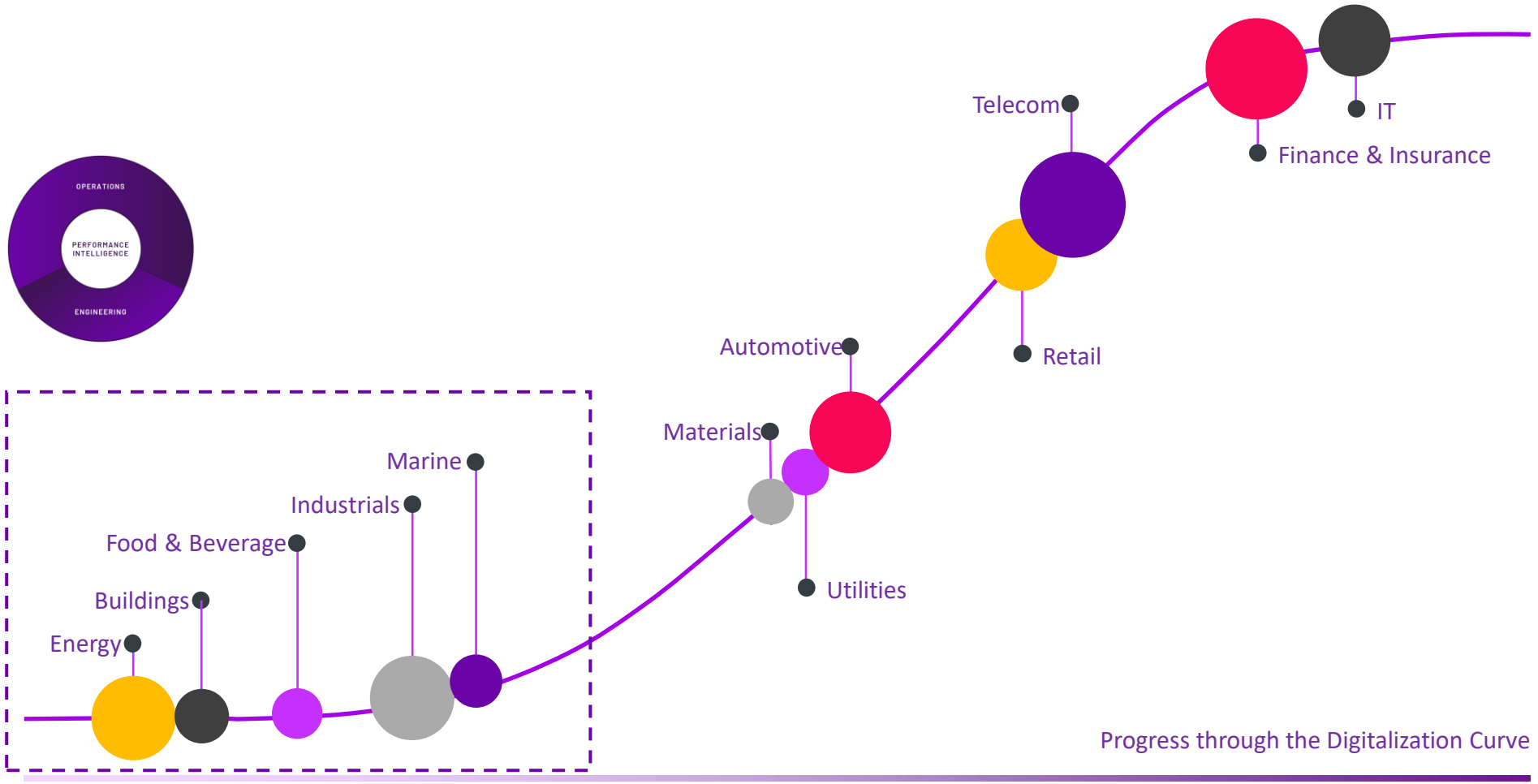
Technology trends

- Cloud
- Industrial IoT/edge
- Big data
- Digital twin
- Artificial intelligence
- Extended reality

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Oil & Gas Digital Transformation continues to languish



Source: AVEVA Market Insights

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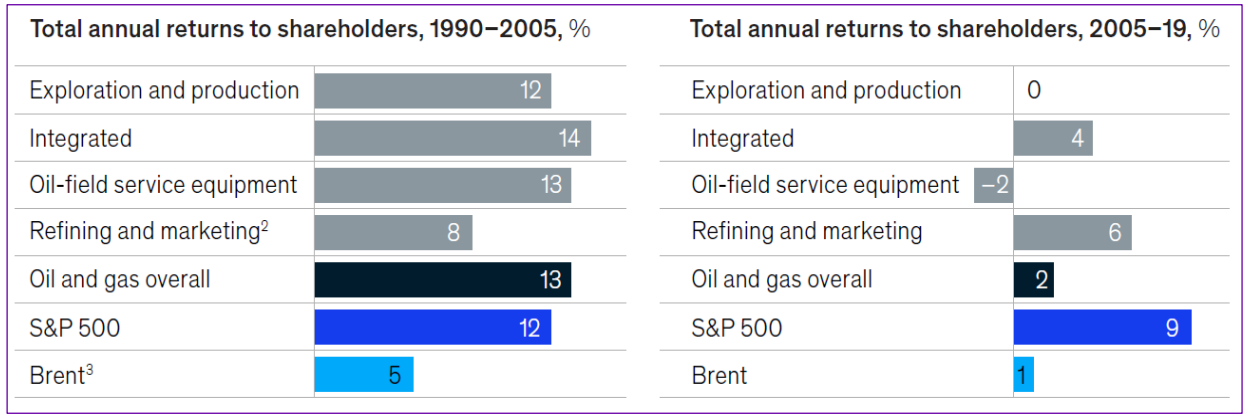
The Challenge: be more green while offering better returns

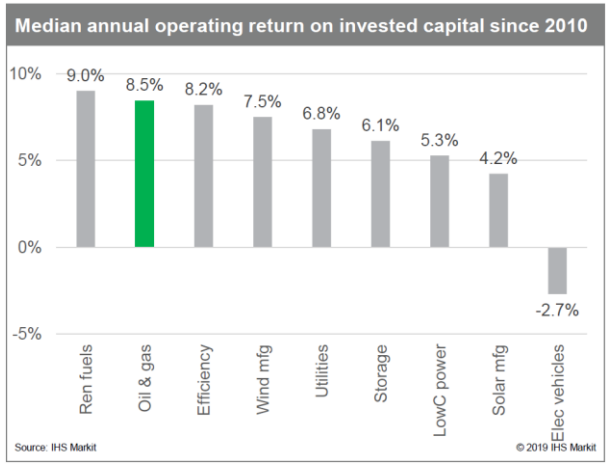
- To meet Sustainable Development Goals, green investment must increase to min 30% of global CAPEX
- Oil & Gas must improve green credentials while…
- Improving the investment case!

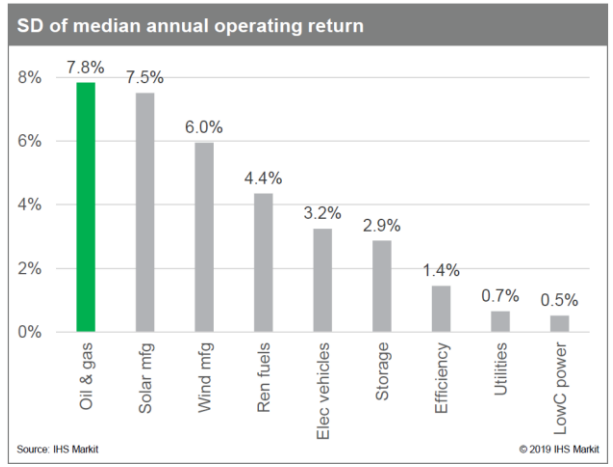
GICS Sector (1)	Green Investment (BAU)	Green Investment (SDG)
Energy	$4,281	$302,118
Utilities	$245,600	$303,071

Source: Global corporate green investment and the UN sustainable development goals, Corporate Knights & Climate Bond initiative, March 2019

Source: McKinsey & Co report: '*Oil and Gas after COVID-19*'







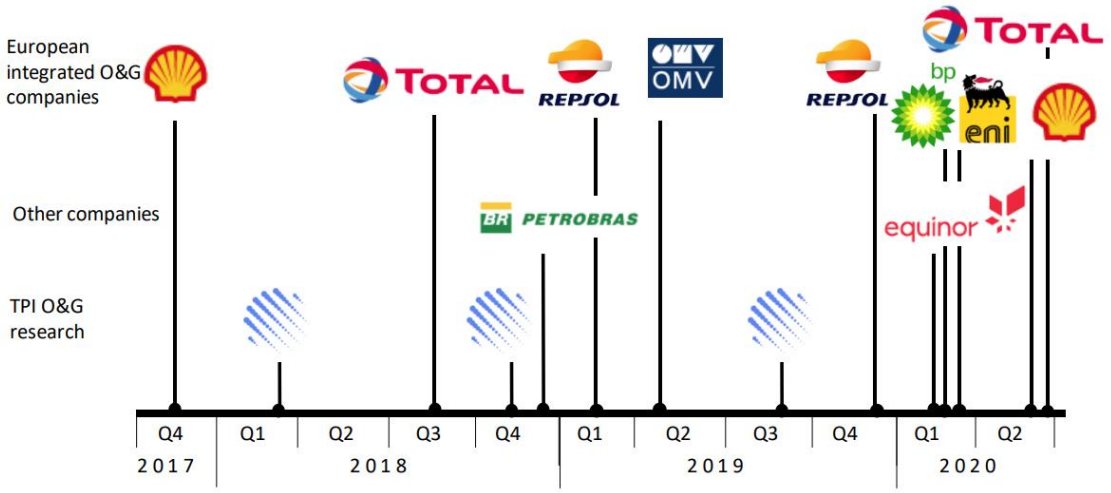
Source: IHS Markit

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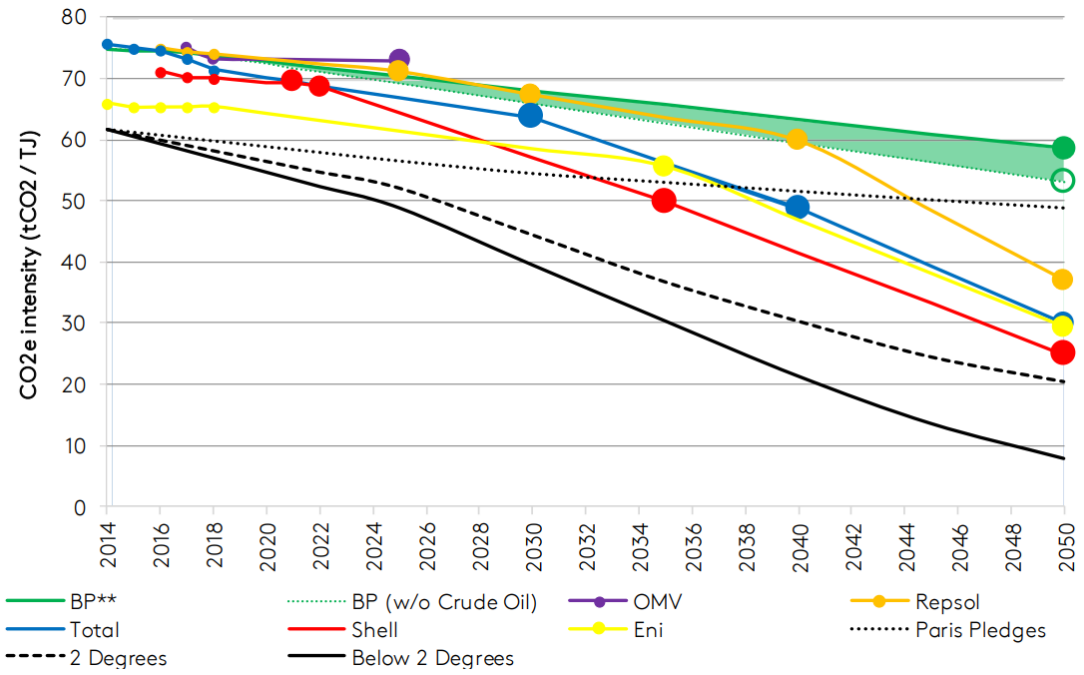
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2050 Climate Goal Progress

EU IOCs leading in setting emissions targets



Dates when oil and gas companies' have set and updated their emission reduction targets, including Scope 3



Announced Emission Intensity Targets by European integrated oil and gas

Ref: 'Carbon Performance of European Integrated Oil and Gas Companies', www.transitionpathwayinitiative.org/tpi/publications/58.pdf?type=Publication

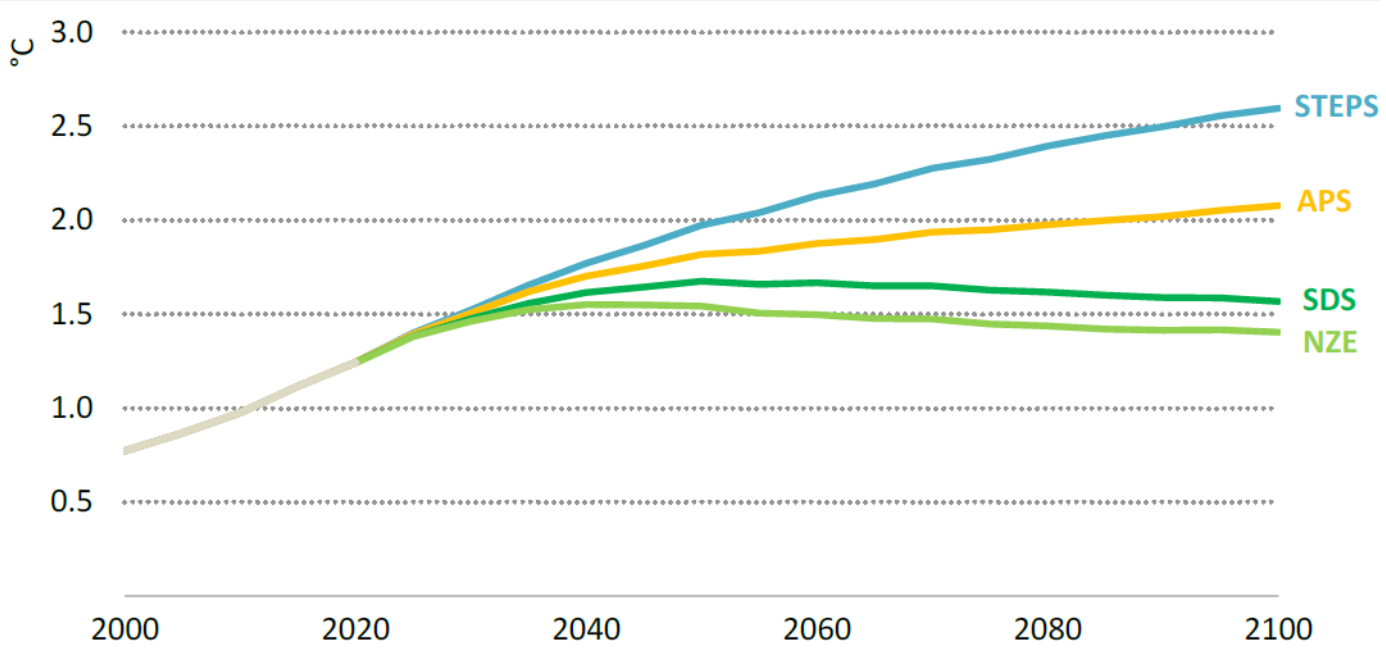
Ref: "Management Quality and Carbon Performance of Energy Companies: September 2020 Update", https://www.transitionpathwayinitiative.org/publications/61.pdf?type=Publication

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World Energy Outlook 2021

Figure 1.5 ▷ Global median surface temperature rise over time in the *WEO-2021* scenarios

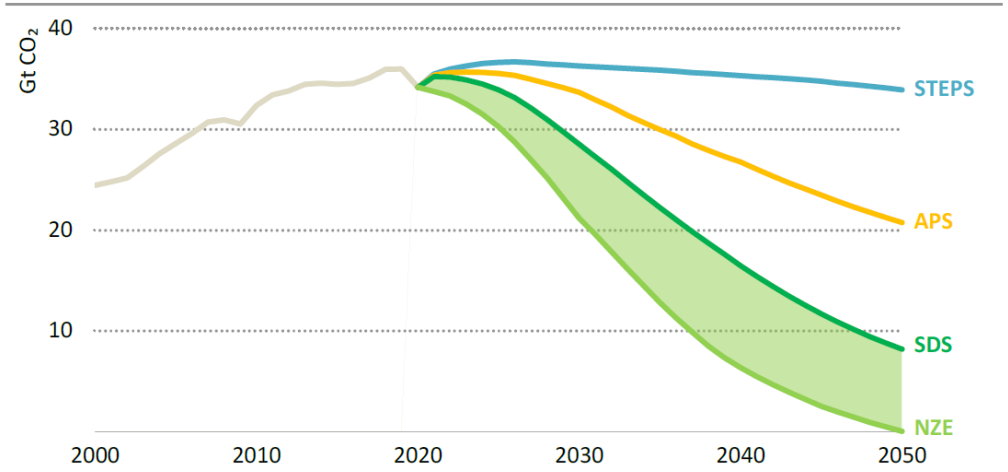


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The temperature rise is 2.6 °C in the STEPS and 2.1 °C in the APS in 2100 and continues to increase. It peaks at 1.7 °C in the SDS and 1.5 °C in the NZE around 2050 and then declines

Source: IEA analysis based on outputs of MAGICC 7.5.3.

Figure 1.4 ▷ CO_2 emissions in the *WEO-2021* scenarios over time

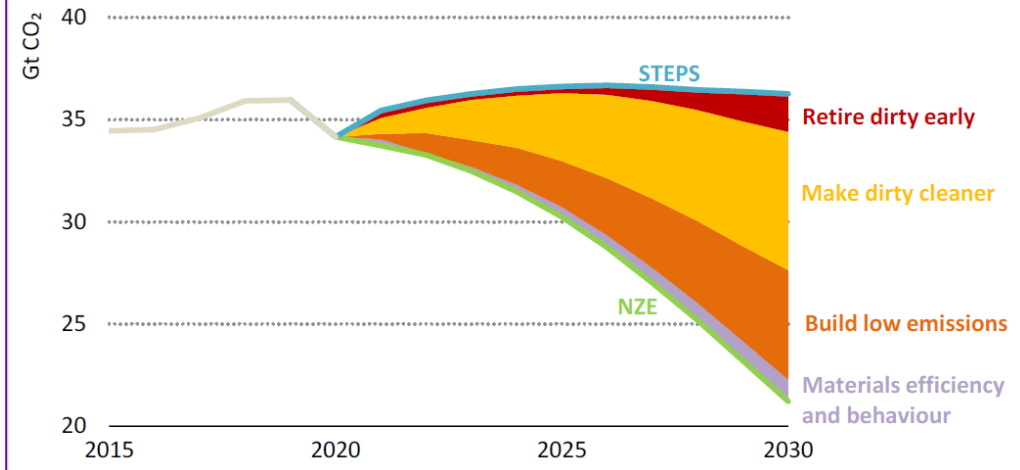


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The APS pushes emissions down, but not until after 2030; the SDS goes further and faster to be aligned with the Paris Agreement; the NZE delivers net zero emissions by 2050

Note: APS = Announced Pledges Scenario; SDS = Sustainable Development Scenario; NZE = Net Zero Emissions by 2050 Scenario.

Figure 1.13 ▷ Emissions reductions in the Net Zero Emissions by 2050 Scenario relative to the Stated Policies Scenario



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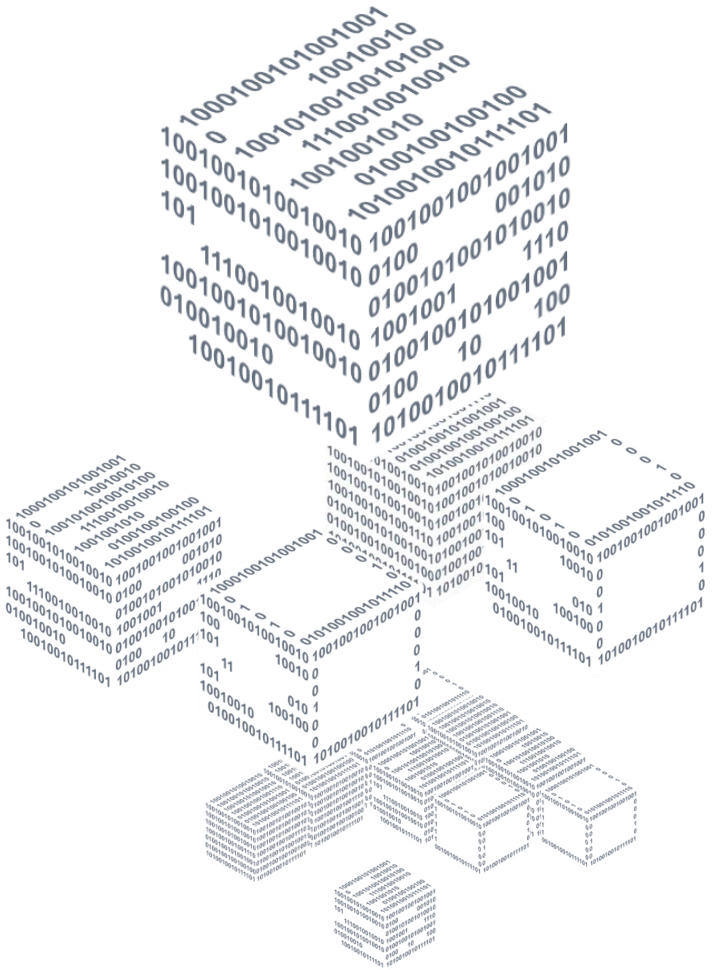
Delivering net zero requires more than retiring dirty and building low emissions projects; there is a large middle ground that defines the speed and scope of change

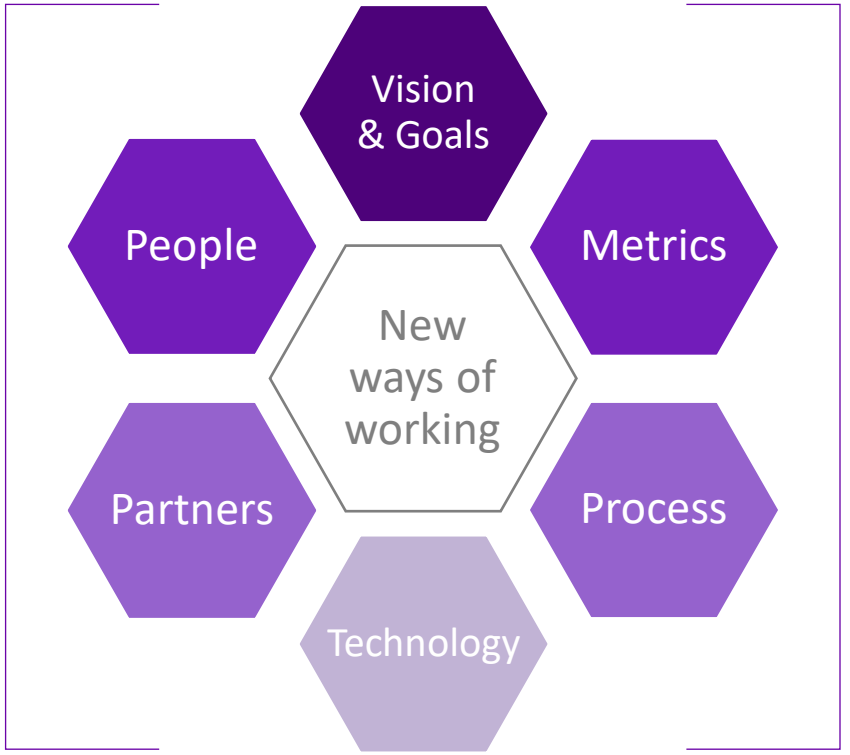
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Digital Transformation for the Plant of the Future

Why Digital Twins should be about a new world of work

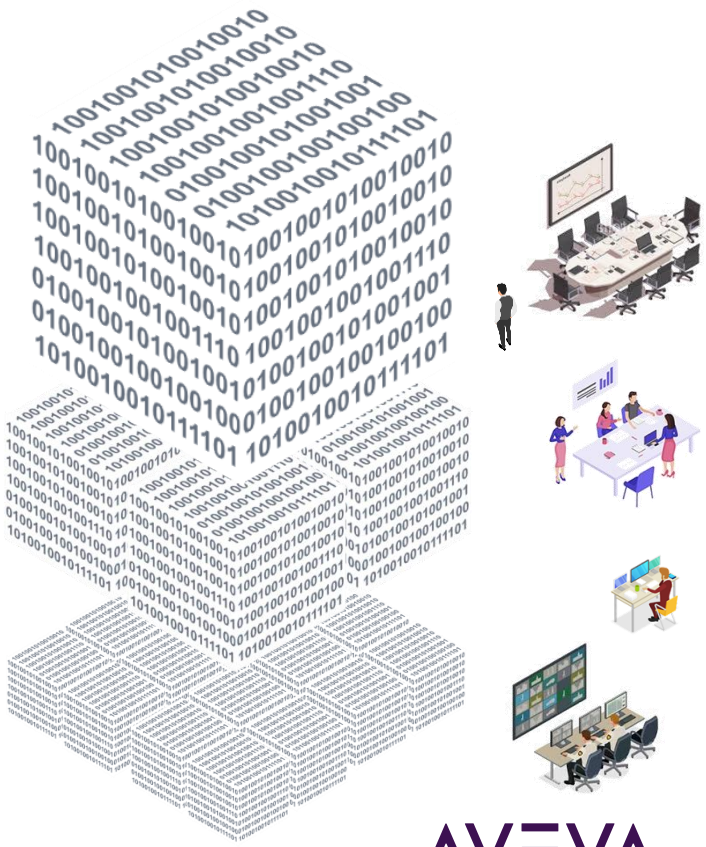
Current state





Future state

(Digital Twin of the “money machine”)



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A trusted future plant strategy

5 steps to modern plants

1. Prioritize the Digital Twin
2. Create data-centric, collaborative processes
3. Account for inevitable change
4. Leverage the cloud
5. Design for optimal operations that can be re-modernized in the future



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Unified Data Platform: Plant of the Future's beating heart

AVEVA's end-to-end industrial software to optimize engineering and operations

+

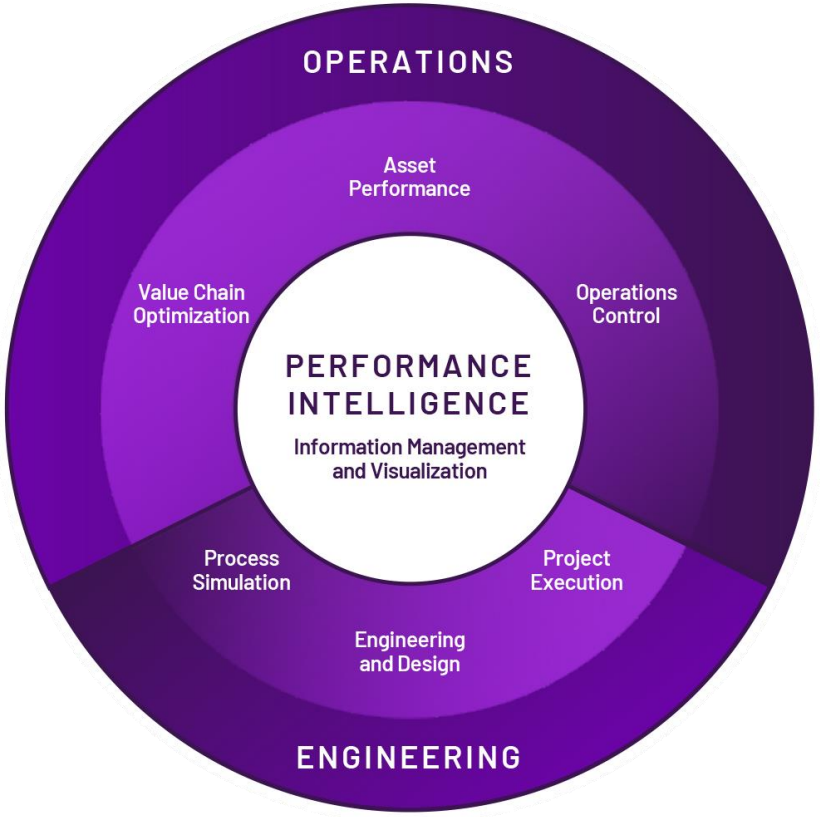
OSIsoft's PI System is the industry standard for industrial information management

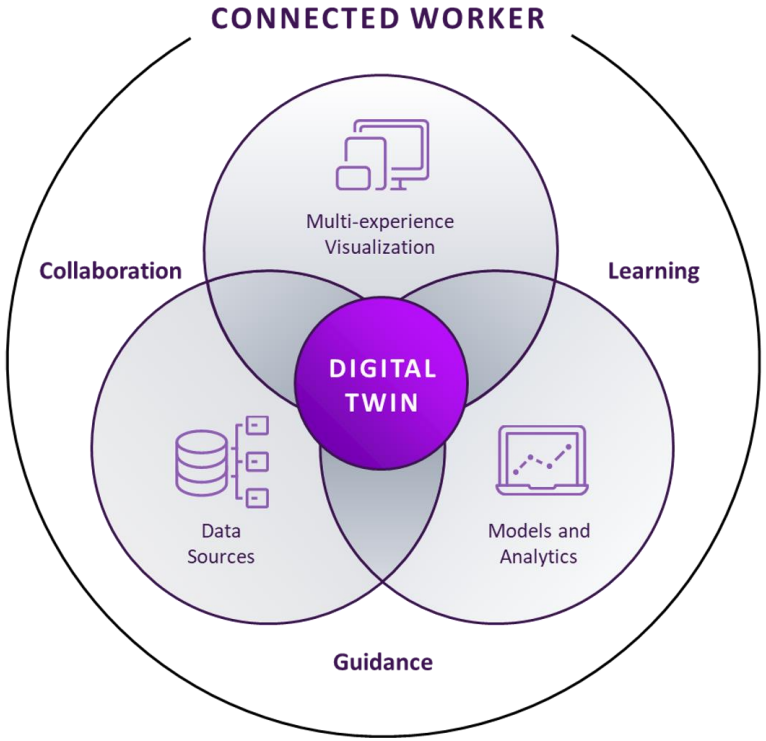
Industry Imperatives

- Energy Transformation
- Consumer Personalization
- Health & Safety
- Smart Infrastructure
- Acceleration of digital work

Technology Imperatives

- Industrial IoT/Edge
- Big Data
- Cloud
- Artificial Intelligence
- Extended Reality





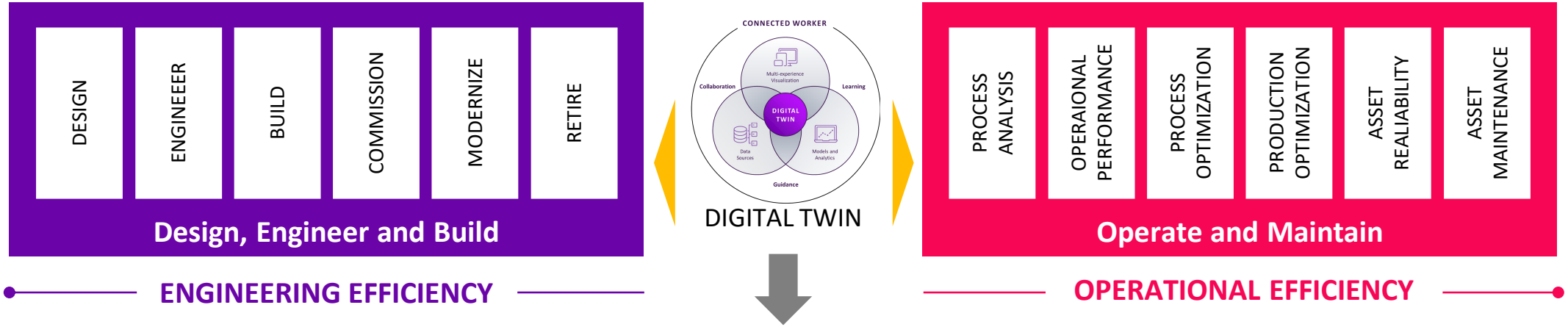
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AVEVA

Insight drives excellence

The Digital Twin delivers actionable, contextualized information to transform your ability to make faster and more reliable decisions, and improve your operational safety, asset integrity and reduce your project risk.



TRUSTED ACTIONABLE INFORMATION IN CONTEXT

AUTHORITY: recognized as the reference of the relevant information.

AUTHENTICITY: can be linked back to its source.

RELIABILITY: can be trusted as a full and accurate representation.

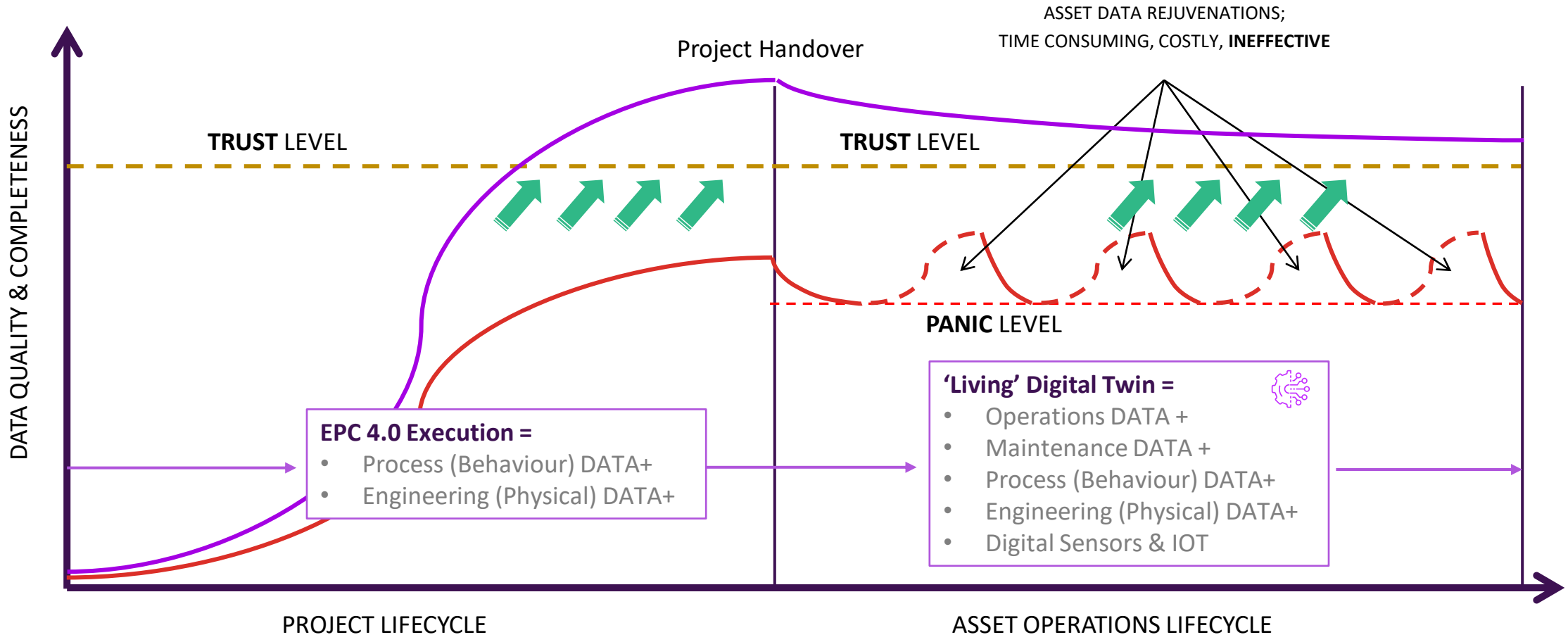
INTEGRITY: complete, unaltered and contextualized.

USABILITY: accessible, can be easily located, retrieved, presented and interpreted.

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Delivering the Plant of the Future: Unified Data from CAPEX into OPEX

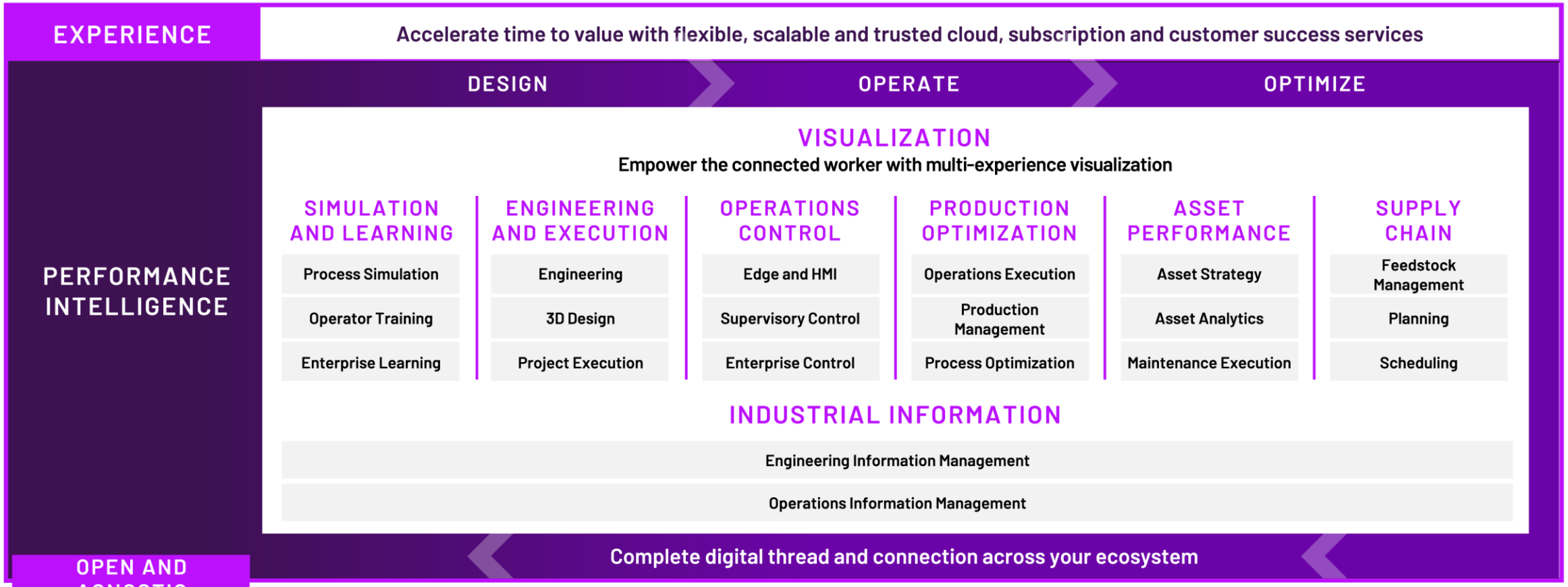


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Unified Data Platform: Plant of the Future's beating heart

Accelerating digital transformation of the industrial world with complementary product offerings



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Plant of the Future: Build for Optimal Performance

Energy Management





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Plant of the Future: Monitor & Control for Optimal Performance

Enterprise Value Chain Optimization



Link to URL

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Plant of the Future turns challenges into opportunities

O&G UPSTREAM

Remote Operations

The right information to the right users at the right time and places, for the right actions



Example of example of unified value chain visualization with transportation, HSE, operations and maintenance, for onshore, offshore, pipelines and shipping

O&G MIDSTREAM

Agile and responsive

Integrated information about safety, reliability and operations for more trustworthy performance



Example of unified LNG visualization with reliability, engineering, operations and maintenance, focused on valves

O&G DOWNSTREAM

Agile and responsive

Integrated visualization for higher confidence in asset capability, value-driven decision-making when assessing feedstocks and impact on operations



Example of unified refinery visualization with reliability, supply chain, engineering, operations and maintenance

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Your Industrial Assets are on a Journey: the next stop is AI

- According to a 2019 McKinsey/WEF study*:
- Industrial Operators fully infusing AI within the next few years will see **+122%** attributable impact on cashflow
- Companies making AI progress by 2030 will see **+10%** impact
- Laggards will see **-23%** impact due to eroding competitiveness



*Source: World Economic Forum & McKinsey 'Global Lighthouse Network: Insights from the Forefront of the Fourth Industrial Revolution', Dec 2019 - link

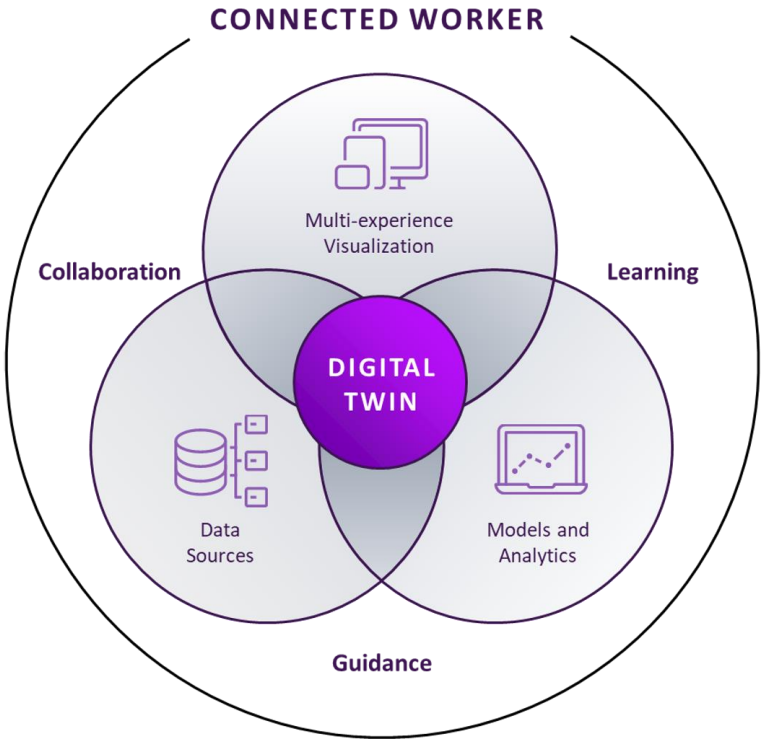
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Wrapping Up

Digital Twin = Unlimited Potential

- Digital Twins go way beyond a 3D model
- Levels of insight grow as you expand your Digital Twin
- Evolution of a Digital Twin will vary business to business
- Asset data is a critical element of the Digital Twin
- AVEVA can be your partner in building the right set of solutions to bring your Digital Twin to life…



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AVEVA is a global leader in industrial software, driving digital transformation and sustainability. By connecting the power of information and artificial intelligence with human insight, AVEVA enables teams to use their data to unlock new value. We call this Performance Intelligence. AVEVA's comprehensive portfolio enables more than 20,000 industrial enterprises to engineer smarter, operate better and drive sustainable efficiency. AVEVA supports customers through a trusted ecosystem that includes 5,500 partners and 5,700 certified developers around the world. The company is headquartered in Cambridge, UK, with over 6,500 employees and 90 offices in over 40 countries.

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