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Integrated Simulation

Bridging Power and Process for Contextualized Insight and Optimization

Amit Kar

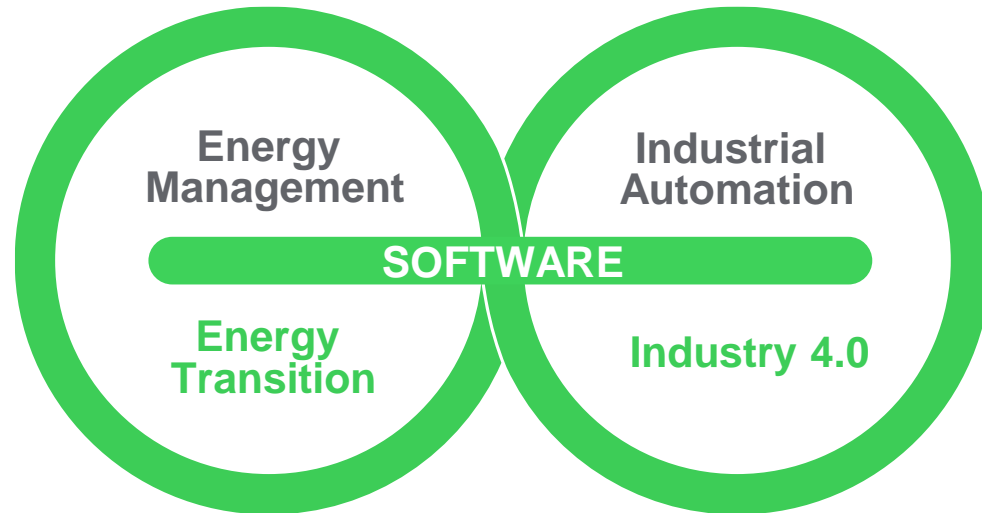
Global Director, Digital Solutions Leader – Energies & Chemicals,
Schneider Electric

AVEVA

Agenda

- Introduction to Schneider Electric and Industry Background
- The Five Key Customer Capabilities
- Focus on Integrated Simulation

Schneider Electric: Software Integrating Power & Process



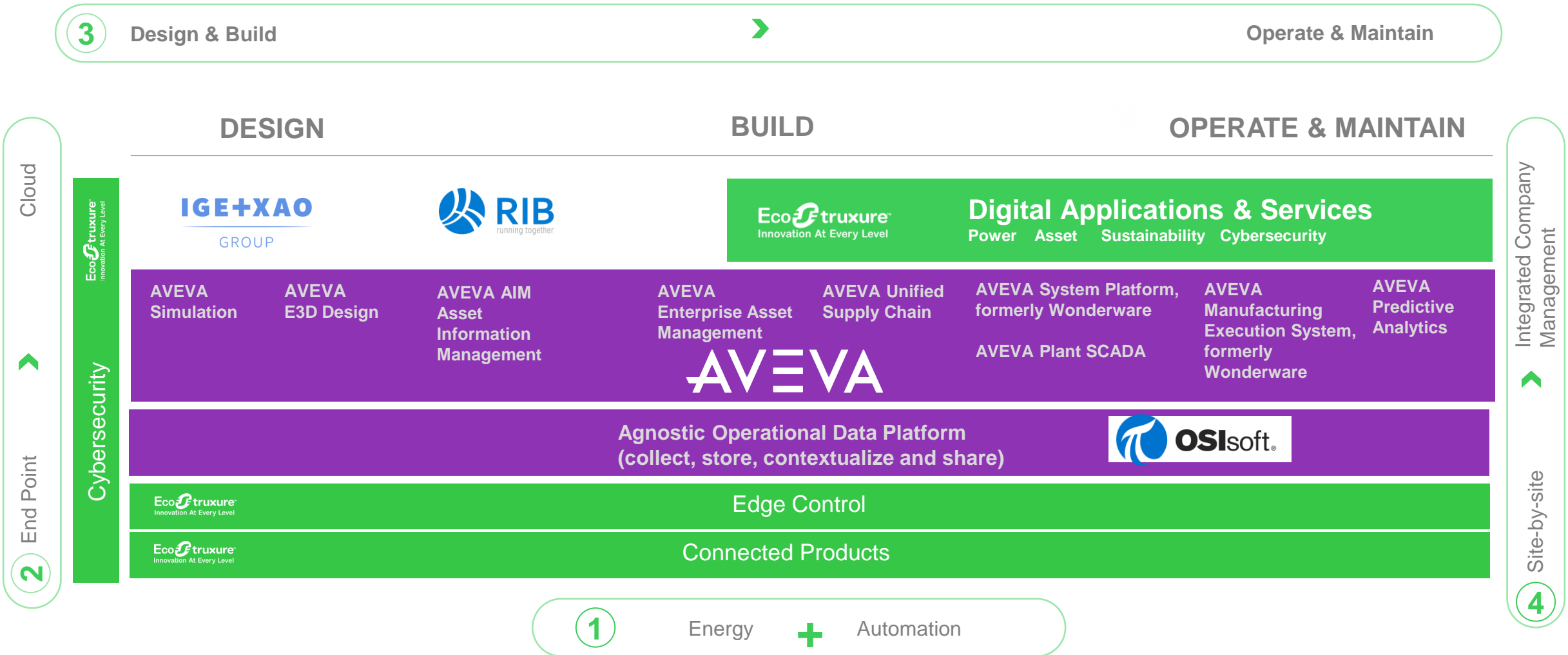
Electrification **SUSTAINABILITY** + Digitization **EFFICIENCY**

Life Is On



60% Revenue done through partners	23k+ Suppliers in production / direct procurement	50+ Investments 100+ Partnerships
4.2k+ EcoXpert program partners	650k+ Service providers & partners	42k+ System integrators & developers
Technological Alliances		
Exchange	100k+ Collaborators	600 Offers listed

Schneider Electric Digital Portfolio: AVEVA at the Core



Industry Challenges and the Energy Trilemma

A Complex and Fluid Global Situation leads to three clear and challenging priorities for Energy



**CONTINUE
PROVIDING STABLE
SUPPLY**



**REDUCE ENERGY
INTENSITY**



DECARBONIZE

“Sell the Hole – not the Drill.”

-- Theodore Levitt, Harvard Marketing Professor

Energy Industry Needs Five Key Capabilities to Respond

Insight-Led Sustainability

Energy needs to be more effectively managed in terms of generation, distribution, supply and demand – while accounting for the wider commercial and environmental context.

Integrated & Autonomous Operations

Enables remote operations and helps reduce/eliminate remote site staffing; puts industrial operations in wider context enabling higher level analysis, optimization, collaboration and action.



Advanced Analytics

Unleash insights and actions not possible through traditional or solely-human analysis, or which would arrive much later; uncover trends in historical data, optimize operations, maintenance and production activities

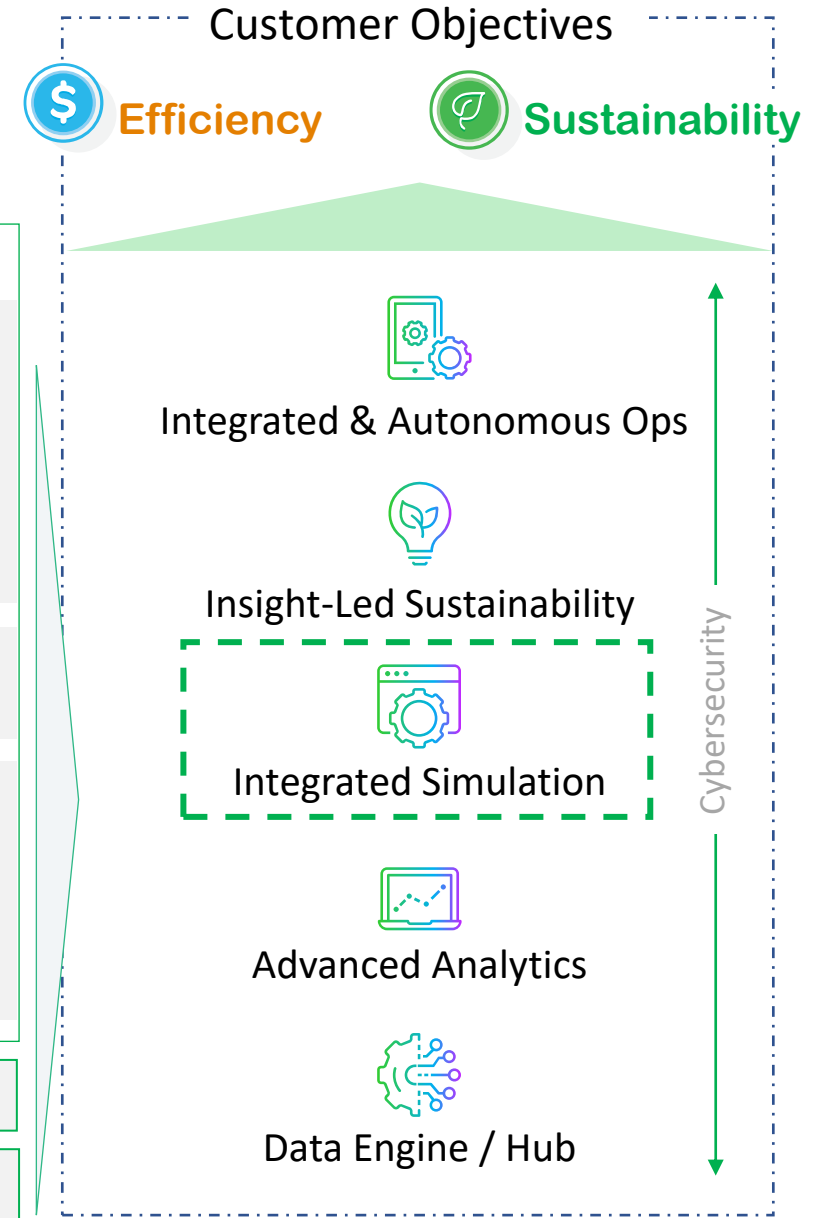
Data Hub / Engine

The capture, aggregation and contextualization of data from previously siloed domains as well as new sources of data

Integrated Simulation

Optimization of design, engineering or operations at the confluence of Power and Process – to unveil new opportunities for energy and commercial efficiency.

A Digital Platform for Energies & Chemicals

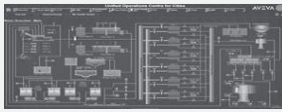


Apps & Analytics

Enterprise Visualization and Collaboration



Engineering data and documents



HMI/SCADA, Historians



Financial, ERP



Weather, Market Data



Maintenance and CMMS

Advanced analytics and artificial intelligence solutions

Industrial information platform

Engineering Information

Operational Information (Real time)

Edge Control

Connected Products

“Learn to see. Realize that everything connects to everything else.”

-- Leonardo Da Vinci, Renaissance Person – literally

ML Approach to Integrated Simulation: Energy & Yield Gains

Challenge:

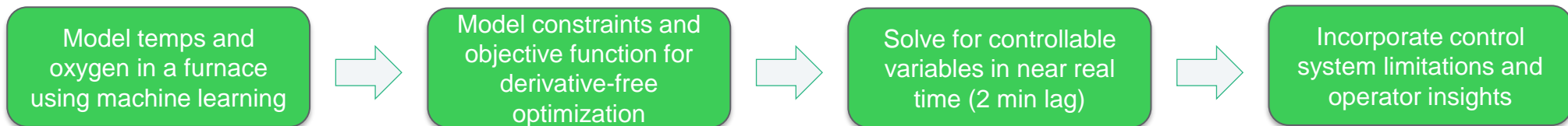
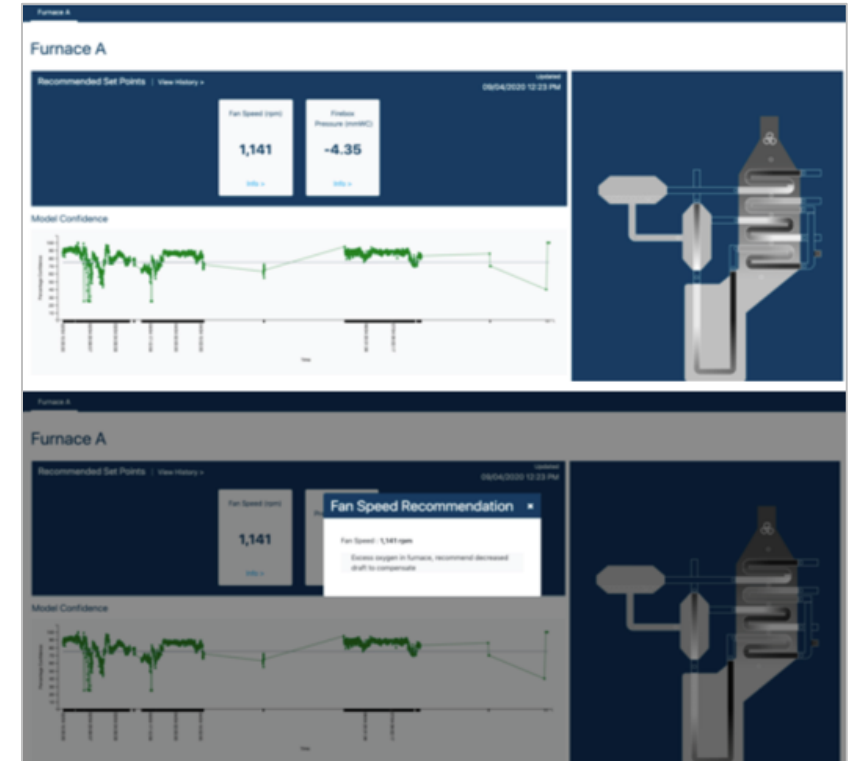
- Regular shut-downs and flaring (18%) from operator attempts to drive efficiency at ethane cracker
- Energy loss and lower conversion yield
- 5 furnaces with 285kTon feed

Solution:

- End-to-end application for yield and efficiency optimization of ethane cracking (to ethylene)
- Application generates optimal set-points for operators, allowing conversion increase, reduction in fuel gas consumption, and avoidance of flaring and shut-downs

Benefits:

- 2.3% improvement in yield
- 7.8% reduction in fuel gas spend



Ecostruxure Digital Dynamic Simulation

Optimizing Electrical Energy Consumption & Improving Uptime in Operational Assets

Why this matters

10-20% of the unplanned SD are caused by electrical problems

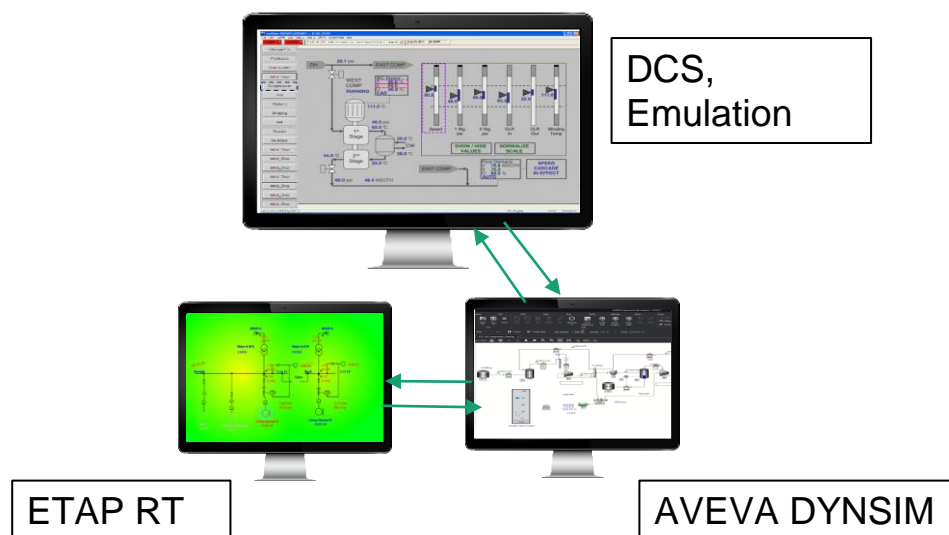
Every electrical model does not take into account the dynamics of the process load

Power Dynamic Modelling usually based on stale / designed conditions not on the current operating conditions



Our solution and How we can help

Modelling the increase (or Decrease) of Electrical Load effects driven by Process Requirement with a integrated dynamic process and electrical study



Our proven impact

Energy- Efficiency Study Services / Deployment e.g: Improving Objective Functions:

Uptime Improvement, e.g: Evaluating all operating conditions and electrical responses; enriched situational awareness

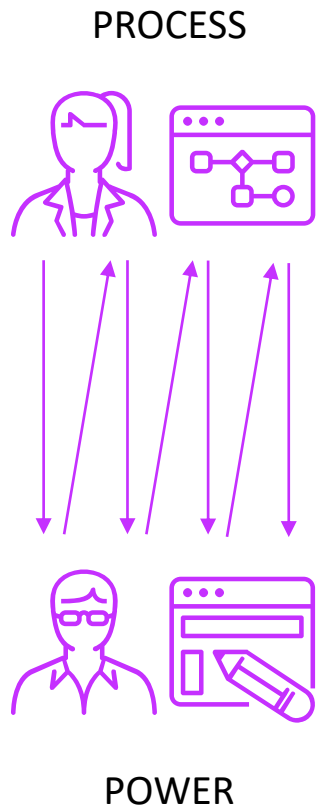


Distinctive Technology

Proven market leaders; an innovative solution agnostic of DCS and EMCS vendor

Integrated Simulation of Power & Process: Design Optimization

SE ETAP and AVEVA Process Simulation: Accelerating and Optimizing During pre-FEED and FEED

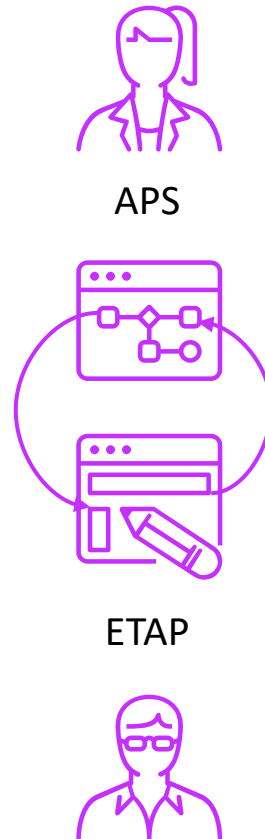


From:

Traditional, siloed and iterative engineering; the results of modifications within discipline-specific applications are repeatedly passed back and forth; optimization constrained by time and interfaces

To:

Accelerated, collaborative engineering; power and process working in sync; design optimization efforts vastly improved



Enabling:

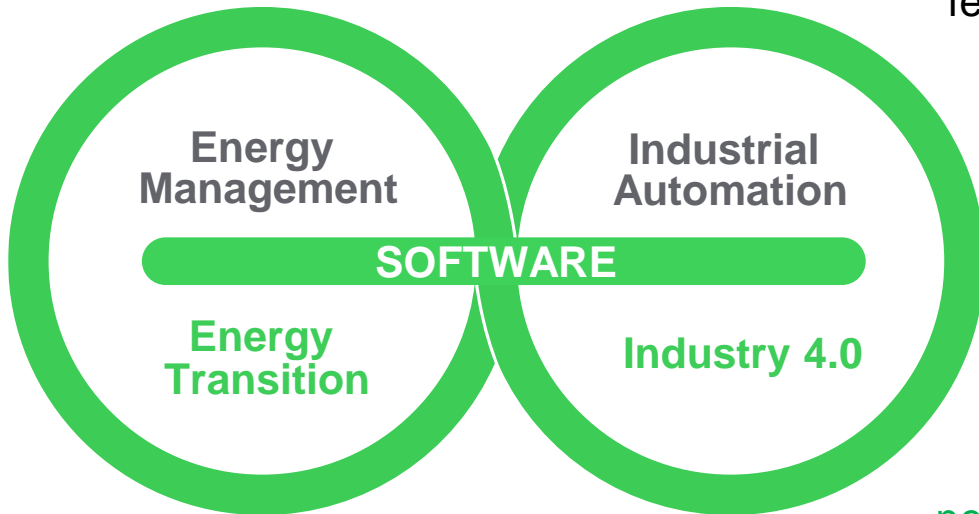
During Pre-FEED: Accelerated evaluation of machine load flow in conjunction with the process flow diagrams:

During FEED: Better optimization of Power & Process plant design, leading more quickly to assurance of adequate machine power supply once mass balances have been calculated.

“Integrated Simulation is the critical link.”

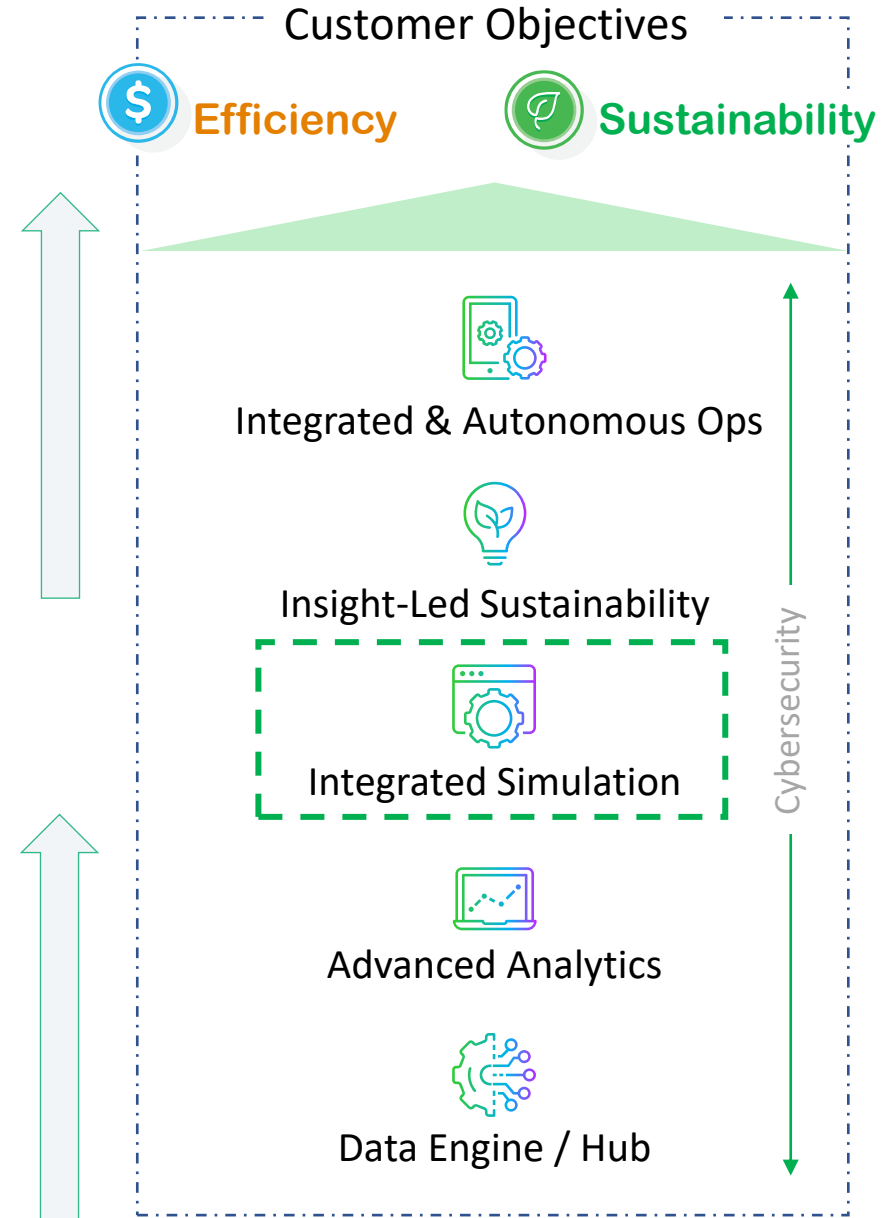
-- Amit Kar, The Person Speaking to You Right Now

Integrated Simulation is the link between Power and Process



Advanced capabilities required to meet demands of the new Industrial Age; most customers not yet ready for these – with a few in the very early stages of developing these.

Fundamental capabilities necessary for the Digitalization journey; widely acknowledged and largely being addressed today with varying success





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Questions?

Please wait for the microphone.
State your name and company.



Please remember to...

Navigate to this session in the mobile app to complete the survey.



Thank you!

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Over 20,000 enterprises in over 100 countries rely on AVEVA to help them deliver life's essentials: safe and reliable energy, food, medicines, infrastructure and more. By connecting people with trusted information and AI-enriched insights, AVEVA enables teams to engineer efficiently and optimize operations, driving growth and sustainability.

Named as one of the world's most innovative companies, AVEVA supports customers with open solutions and the expertise of more than 6,400 employees, 5,000 partners and 5,700 certified developers. The company is headquartered in Cambridge, UK.

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