Virtual Commissioning with Simulink
Part 2: Virtual Commissioning

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“Harnessing technology is central to making insert your field here *safer and more efficient”*

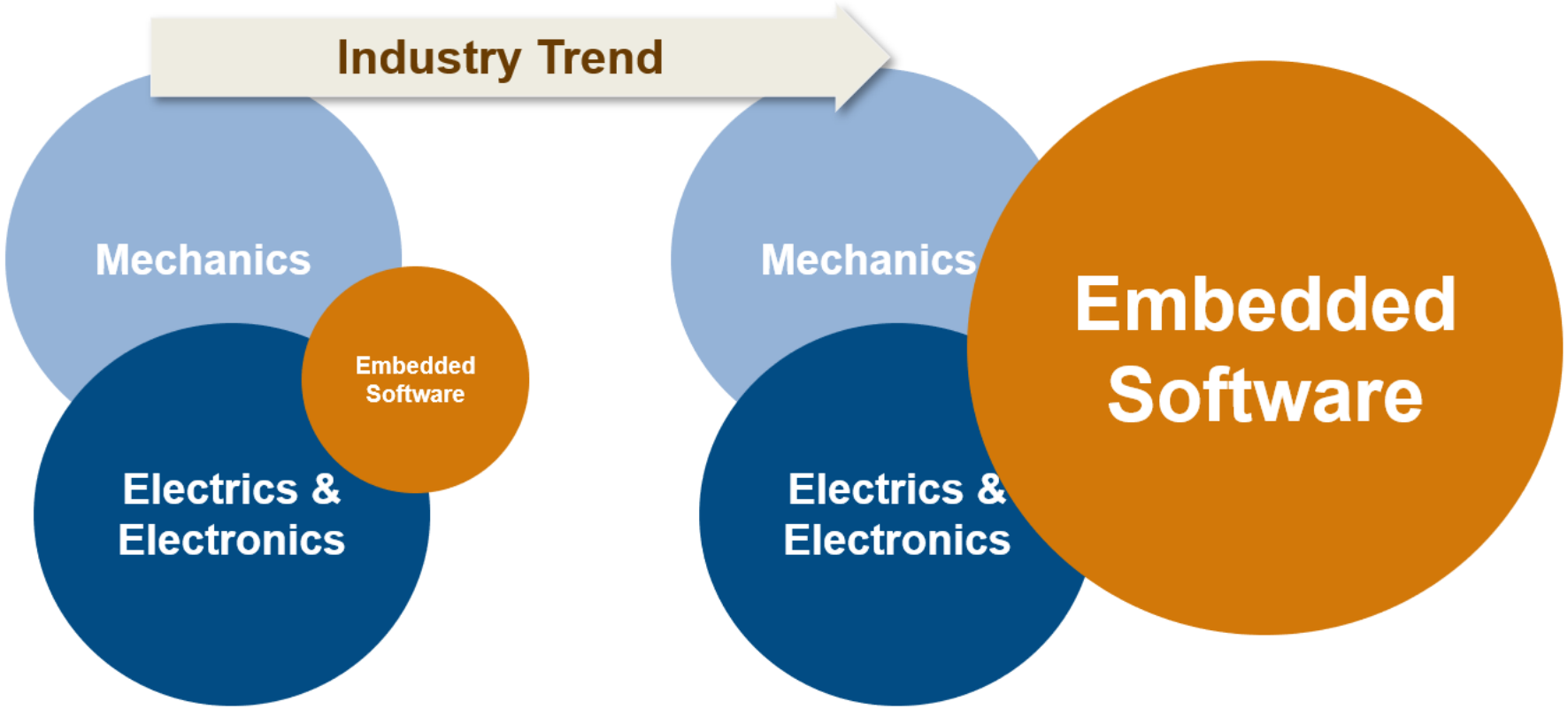
Gary Goldberg, President and Chief Executive Officer, Newmont Mining Corporation, USA

Source:
Digital Transformation Initiative, Mining and Metals Industry
[2017, World Economic Forum in collaboration with Accenture]

Analytics techniques applied to big data and the use of new sensors can strengthen process control and boost plants' hourly profit by optimizing process parameters used to balance yield, throughput, recovery, and material costs. For example, yield, energy, and throughput (YET) analytics alone can improve EBITDA by 2 to 3 percentage points (reducing manufacturing costs by 3 to 5 percent, and leading to significant debottlenecking opportunities).

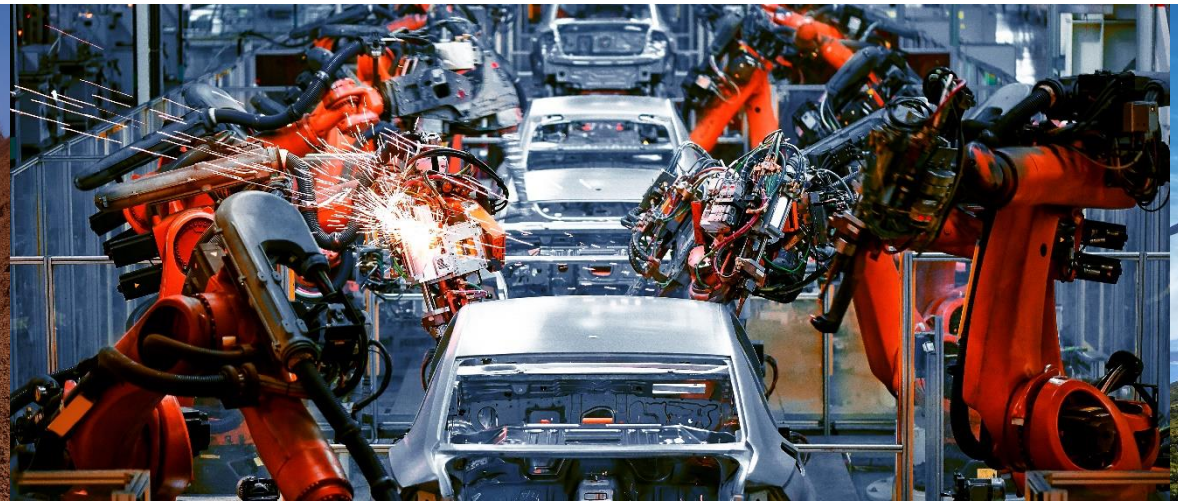
Source: Unlocking the digital opportunity in metals [McKinsey 2018, Lapo Mori]

All industries experience a trend to increasingly complex systems



Recap

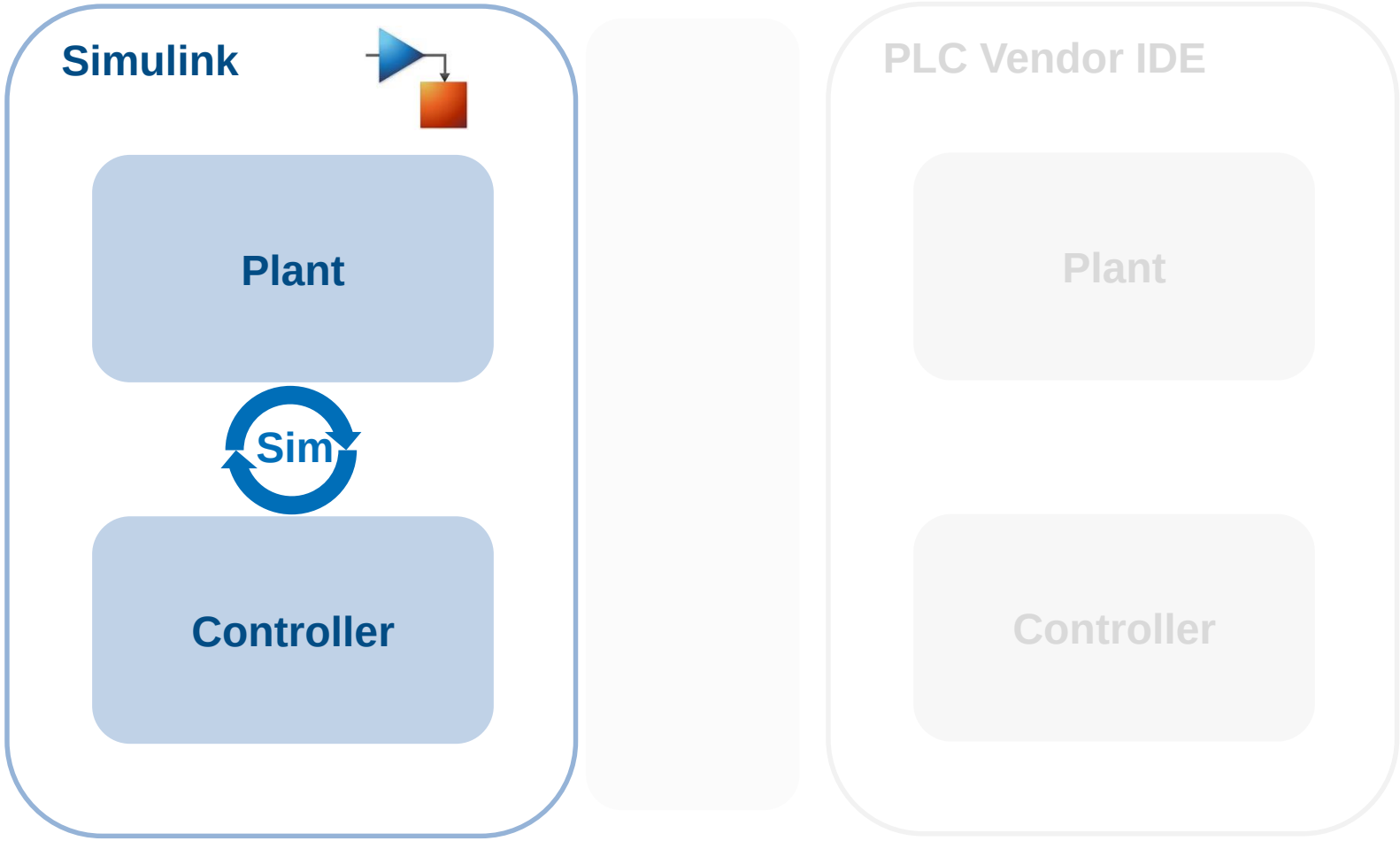
Trying new technology on the physical system can be expensive and sometimes impossible



Recap

Using a virtual system (model) for design is your first step

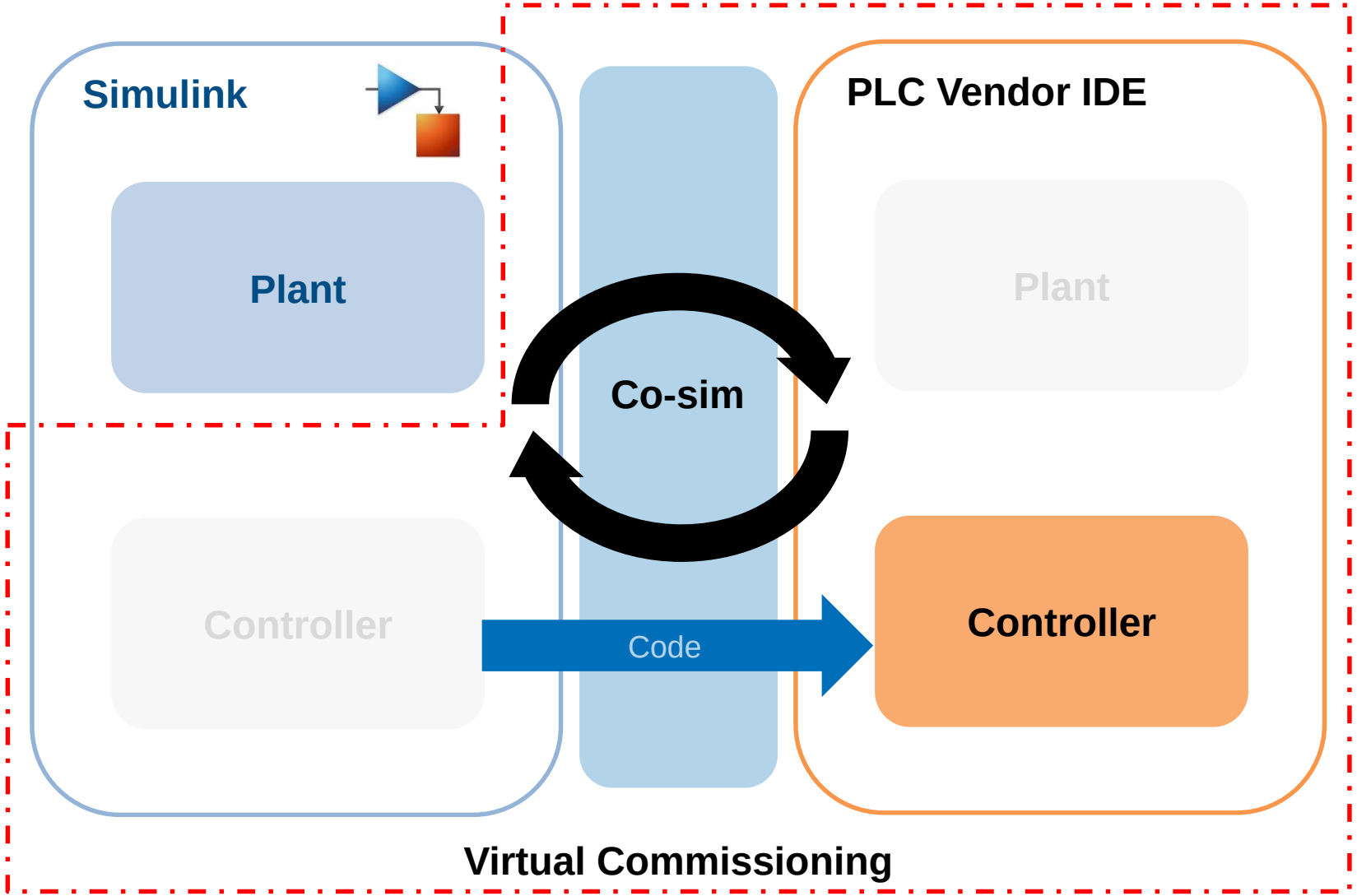
- ✓ Simulation



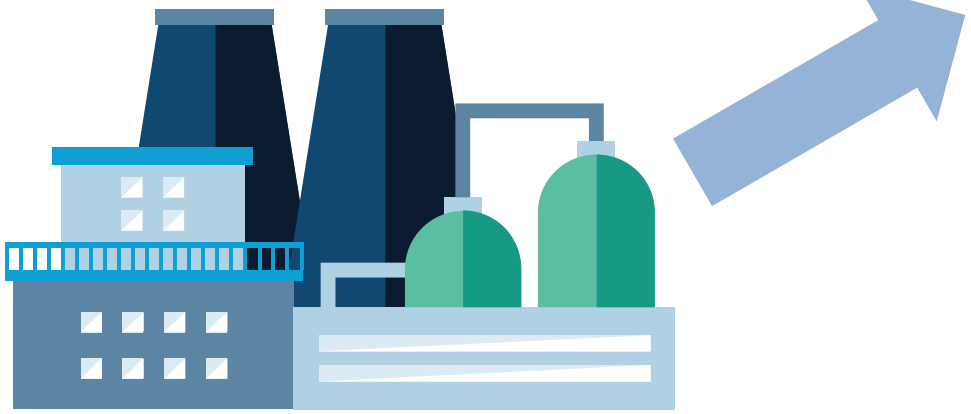
Recap

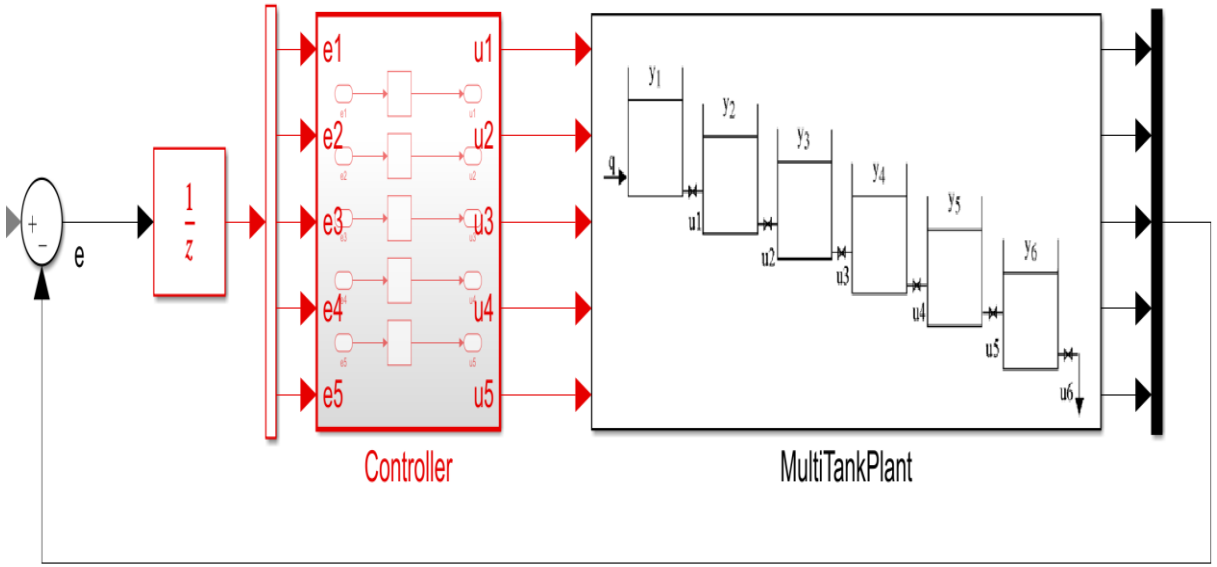
Integrating your model with real system is the second step

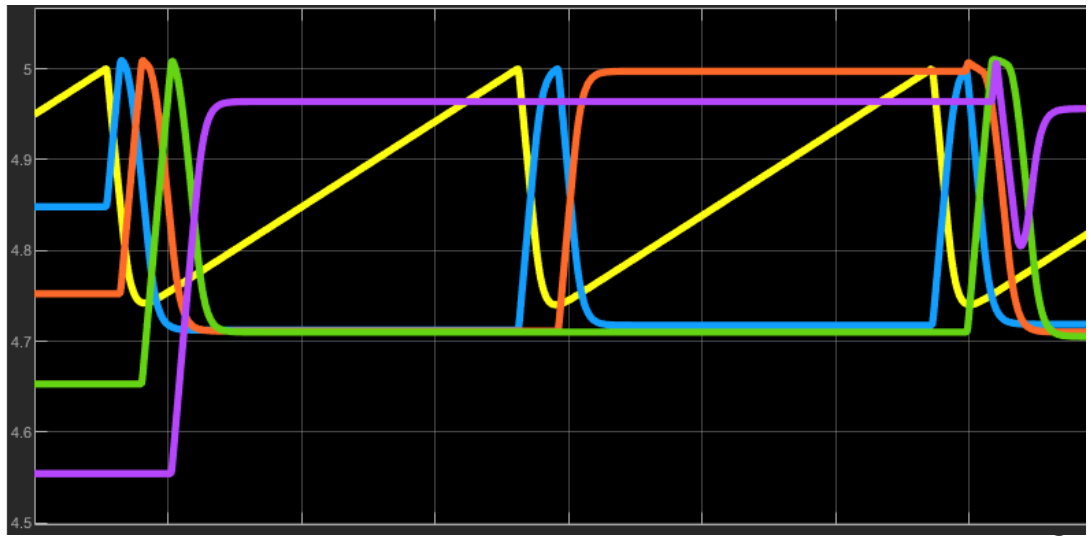
- ✓ Simulation
- Code Generation
- Virtual Commissioning



‘Virtual commissioning’ tests your new algorithm with a virtual plant

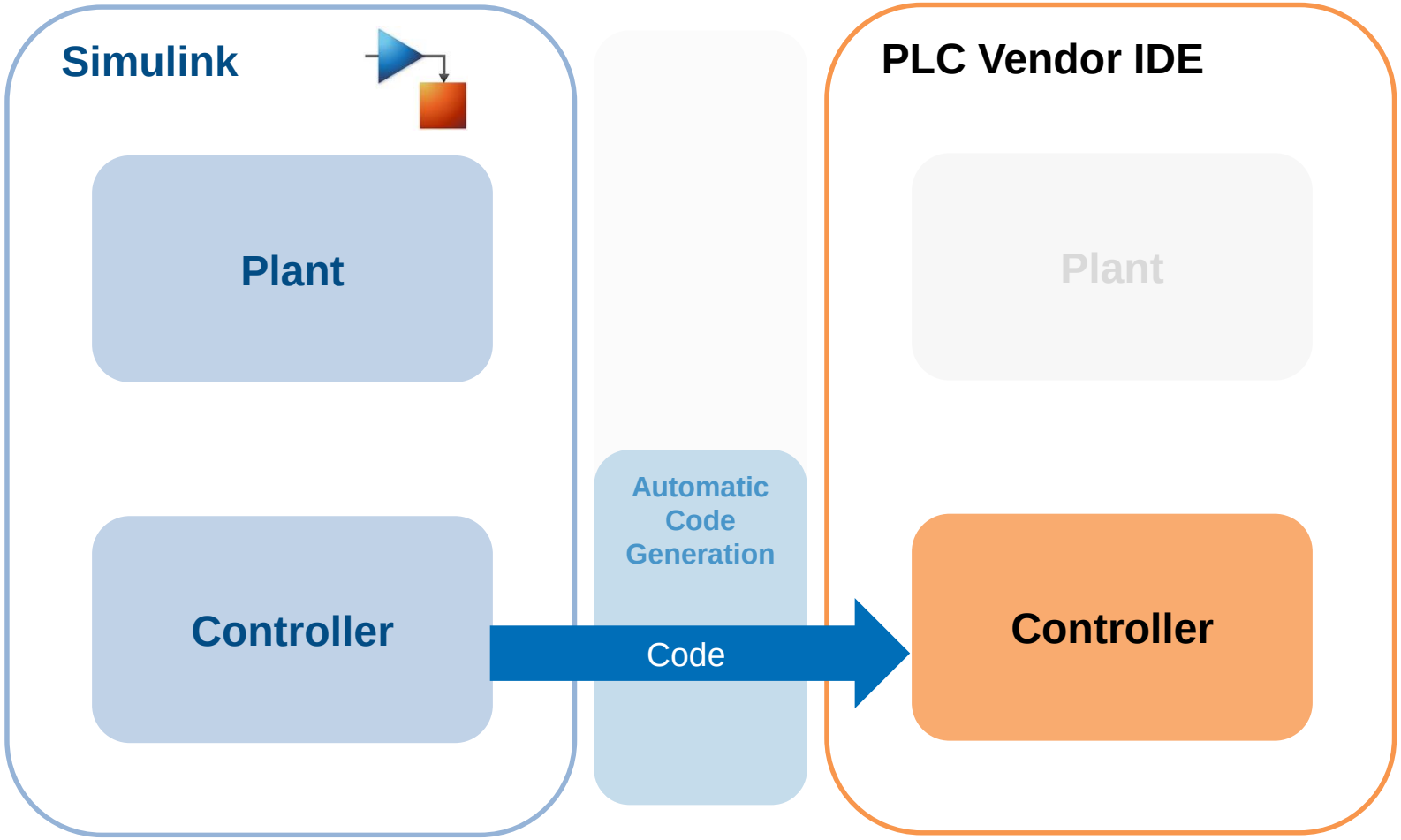




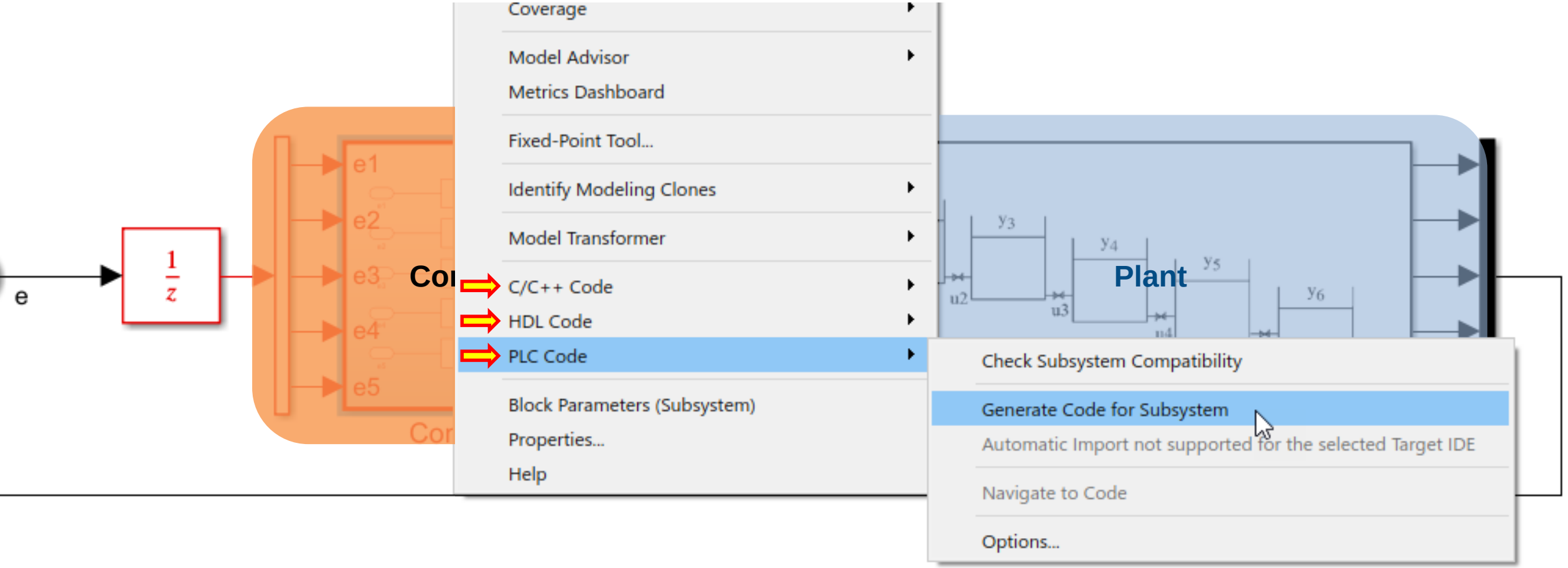


Automatically transfer your algorithm to your controls platform

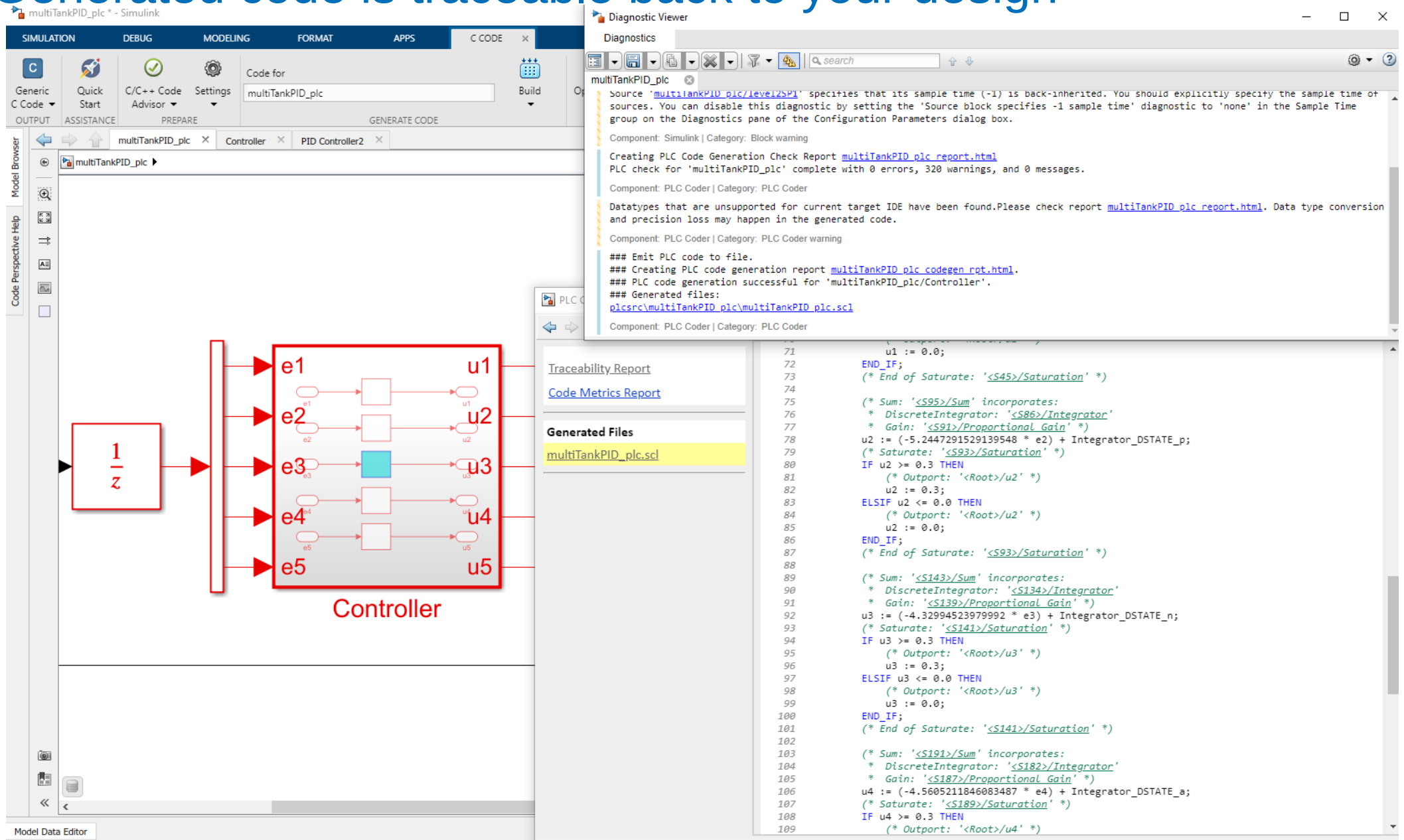
- ✓ Simulation
- ▪ Code Generation



Code Generation is simple, fast and reliable

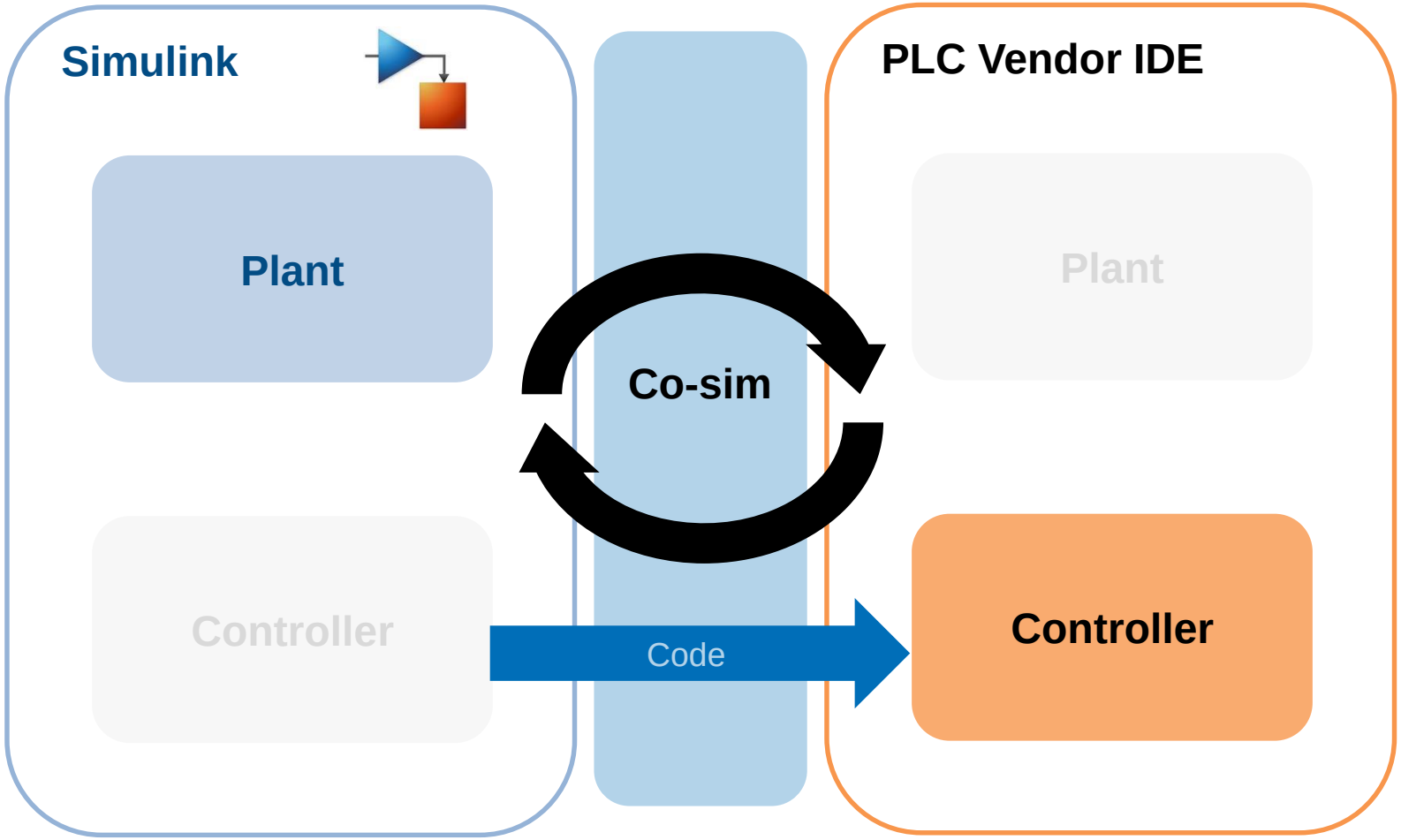


Generated code is traceable back to your design



Simulate your production algorithm with a virtual plant

- ✓ Simulation
- ✓ Code Generation
- ▪ Virtual Commissioning



Simulate your production algorithm with a virtual plant

- ✓ Simulation
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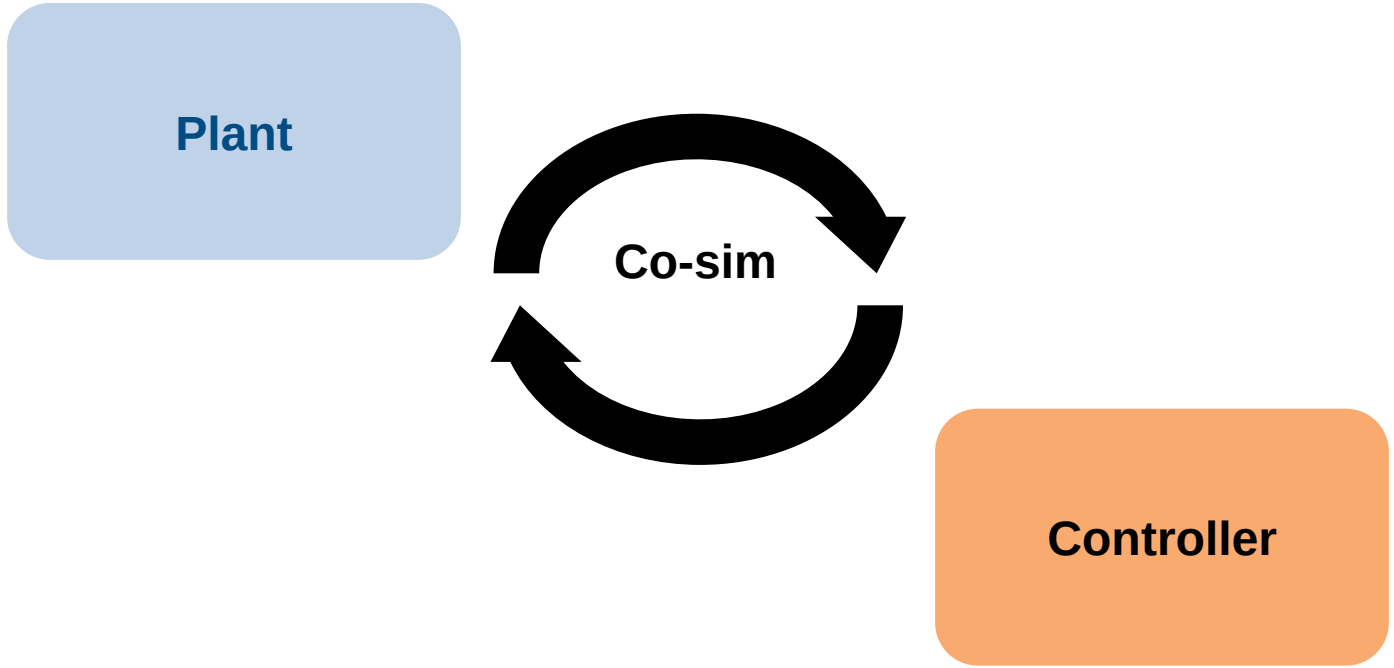
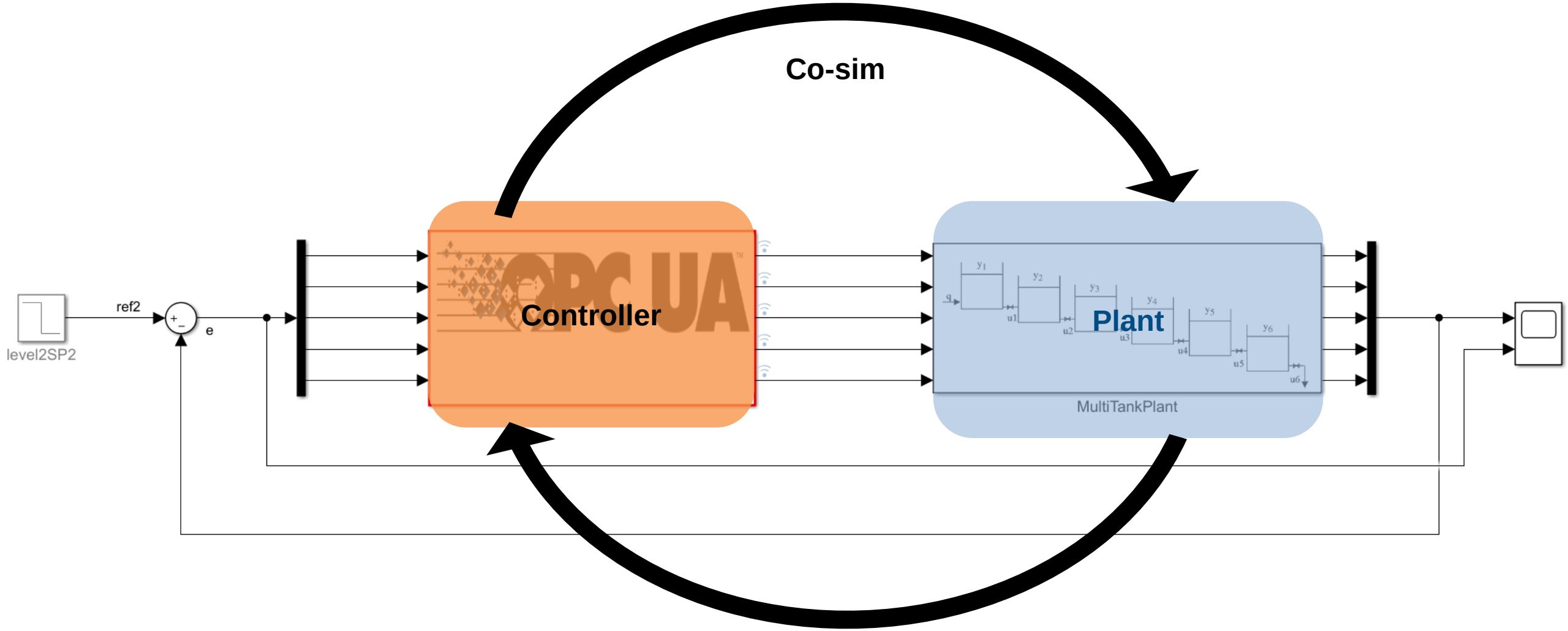
- ▪ Virtual Commissioning



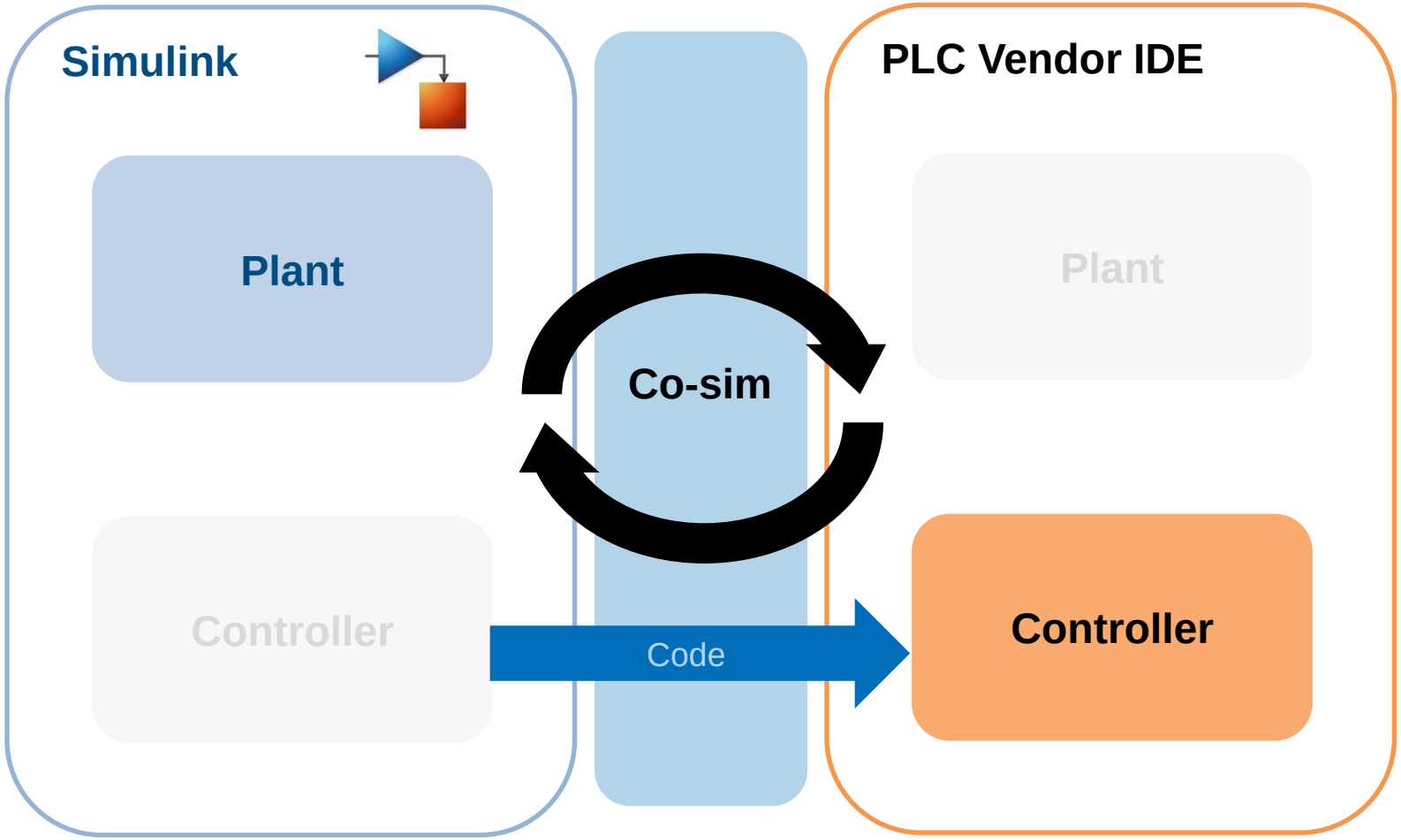
Virtual Commissioning looks just like a regular simulation



Let’s see this in action

We just saw a Simulink plant model co-simulating with a PLC

- ✓ Simulation
- ✓ Code Generation
- ✓ Virtual Commissioning



When you use virtual commissioning you can also …

Deploy optimal algorithms to production automatically

Explore new plant designs with real control systems without affecting production

Leverage any platform
(e.g. PLC vendors, FPGA, GPU, Cloud, Embedded ...)

Reuse the virtual plant as a training simulator

Baker Hughes Improves Precision of Oil and Gas Drilling Equipment

Hardware (PLC) In the Loop = Virtual Commissioning

Challenge

Improve the quality and precision of directional measurement algorithms for oil and gas drilling equipment

Solution

Use
meas
prod

teerable System

Res

- E
- F
- F

Expensive field tests minimized. "A single field test can cost more than $100,000, and even at that cost does not replicate the complex scenarios our customers encounter," says Hoehn. "Simulations and HIL tests with Model-Based Design enabled us to simulate realistic conditions and conduct fewer field tests."

expertise and
bedded Coder
our resources
m design and

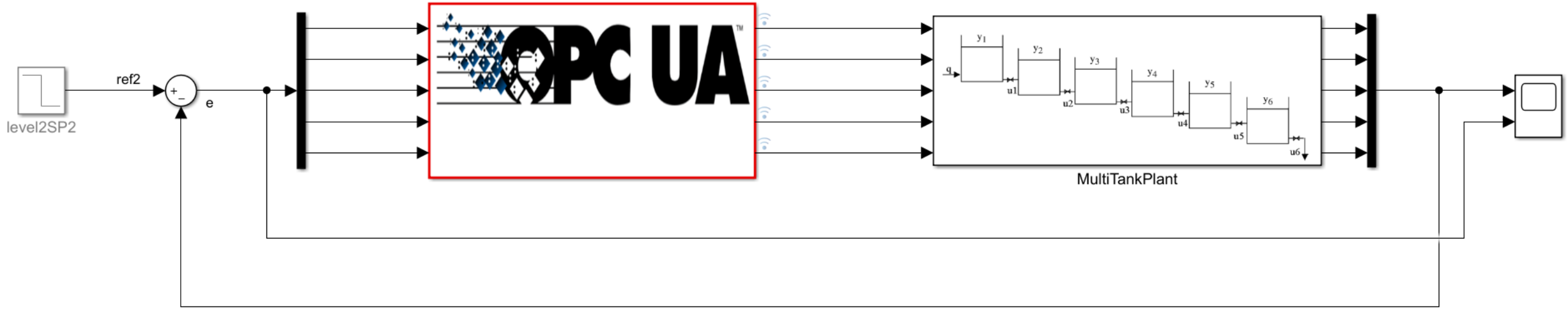
- Ingolf Wassermann, Baker Hughes

Link to user story

Leverage Virtual Commissioning with Simulink to

Reduce risk of costly downtime by testing integration of new algorithms virtually first

Save time by rapidly iterating your design in a virtual environment



Recap

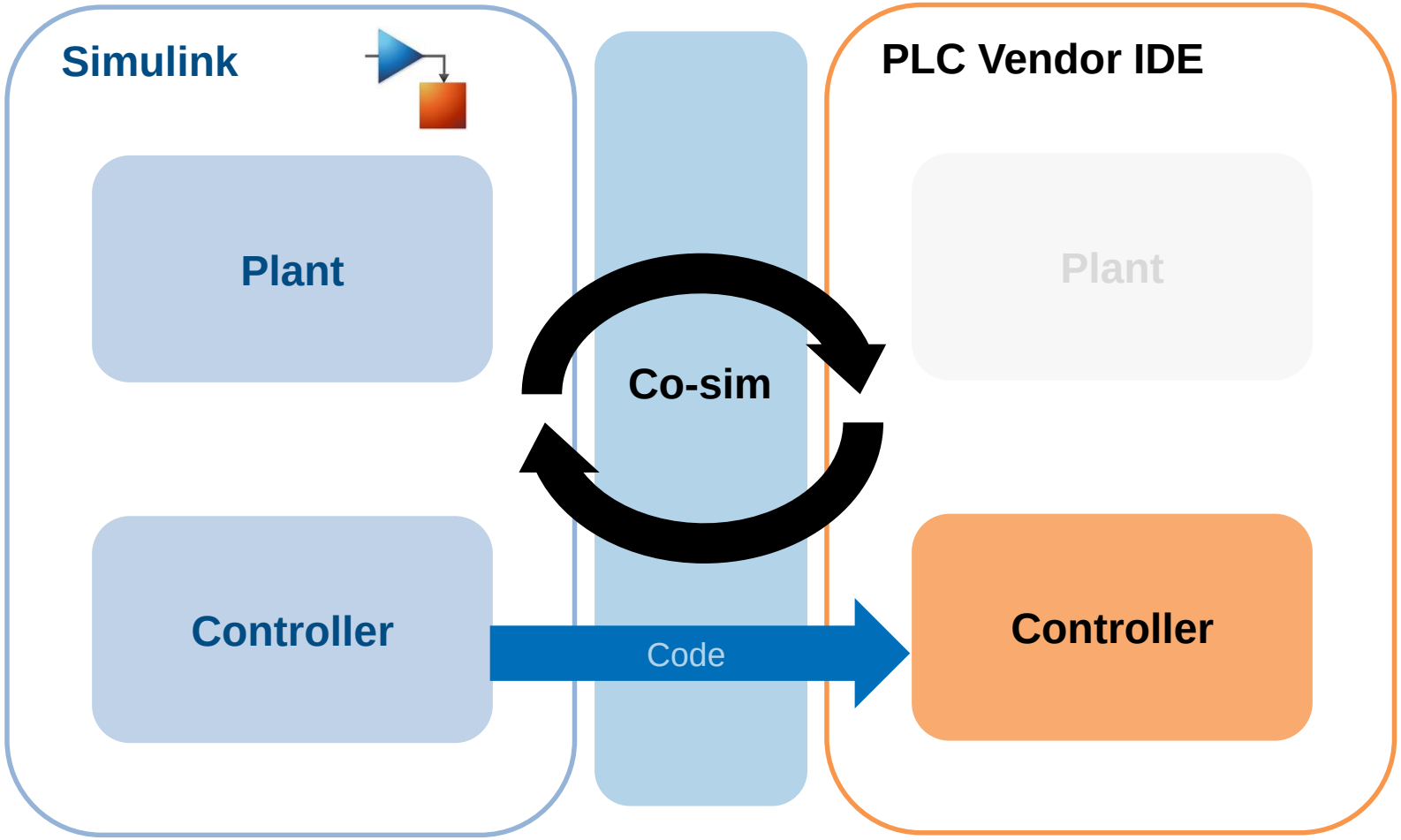
Save time and money by using Simulink models for your design

Reduce risk of costly downtime by testing your algorithms in simulation first,

and then by validating the integration of new algorithms virtually

Improve performance of your increasingly complex system

Save time by rapidly iterating your design in a virtual environment



Where to go from here

Attend upcoming webinars

- MATLAB and Simulink for Mining Webinar Series

Additional resources on our website

- Virtual Commissioning White Paper
- Virtual Commissioning with Simulink
- Mining Webinar – Part 1: Design with Simulation

Contact us for guided evaluation

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