



# Power System Model Optimisation and Validation Workflow



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# Electricity networks are seeing an increased influx of grid-scale renewable energy installations



Climate change



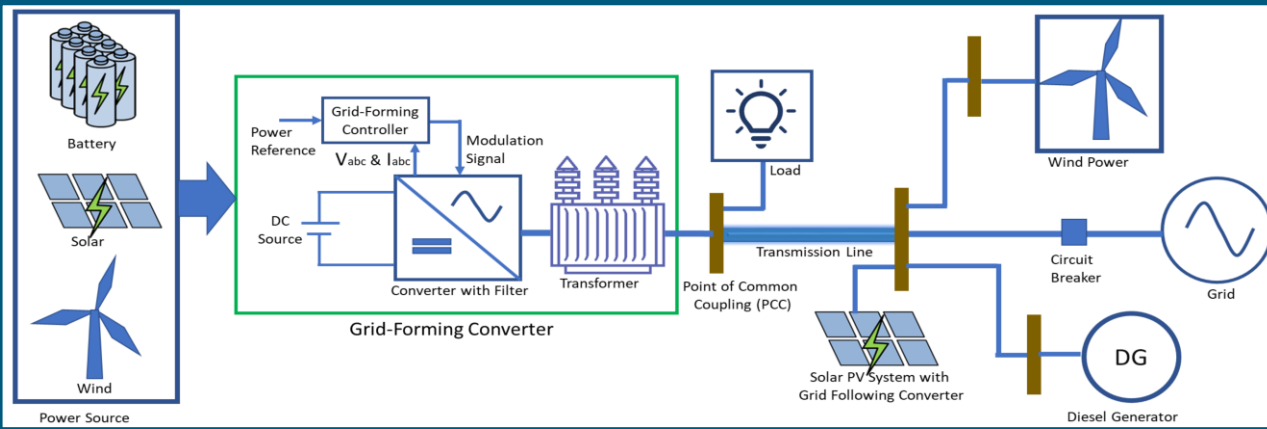
Limited resources



Environment degradation

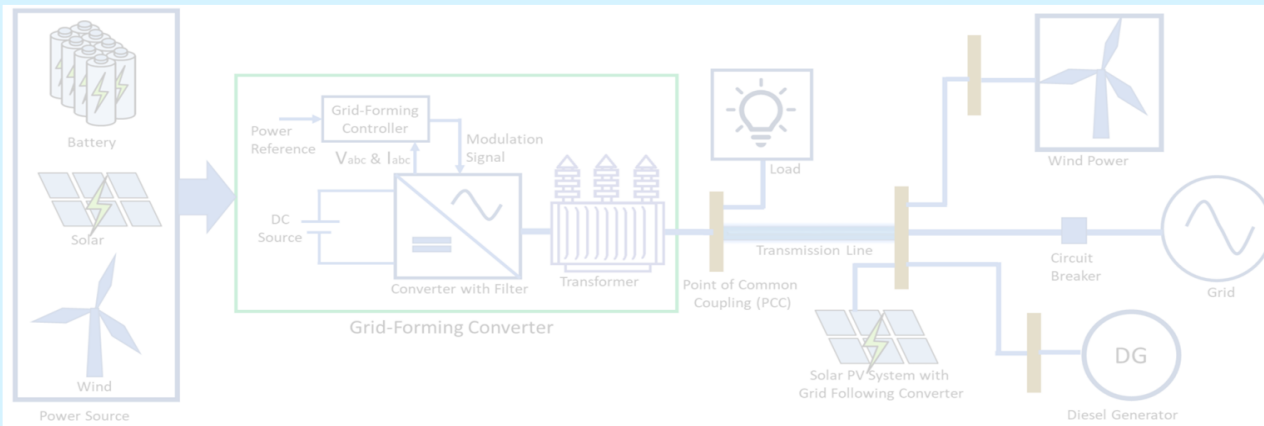
Increased influx of grid-scale renewable energy installations requires addressing many questions to ensure grid reliability

Is the overall system robust and reliable?

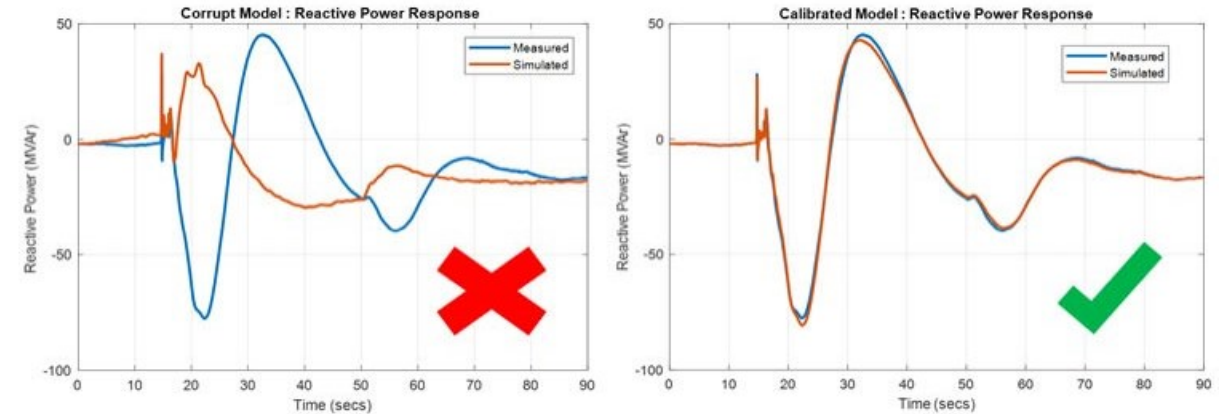


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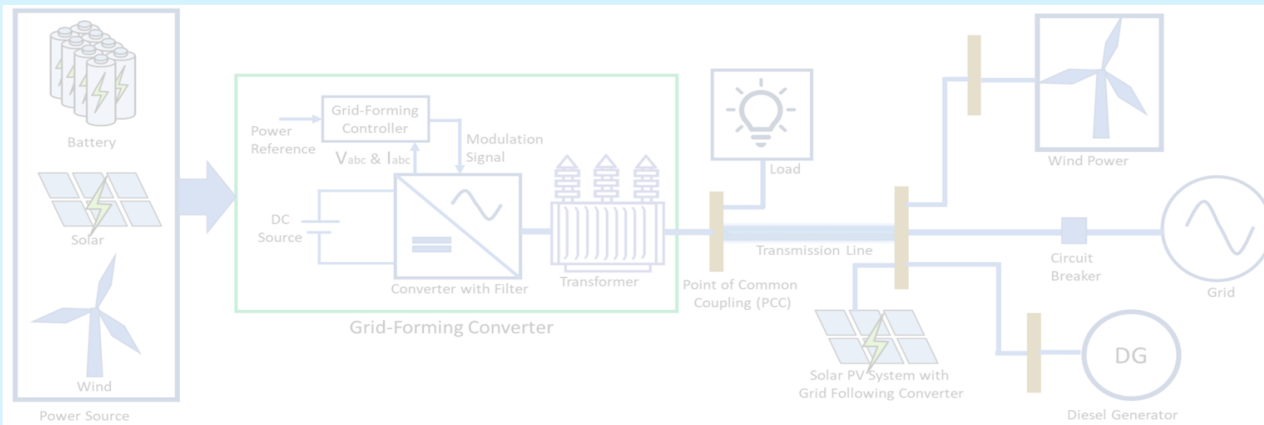


How to validate the asset models are accurate?

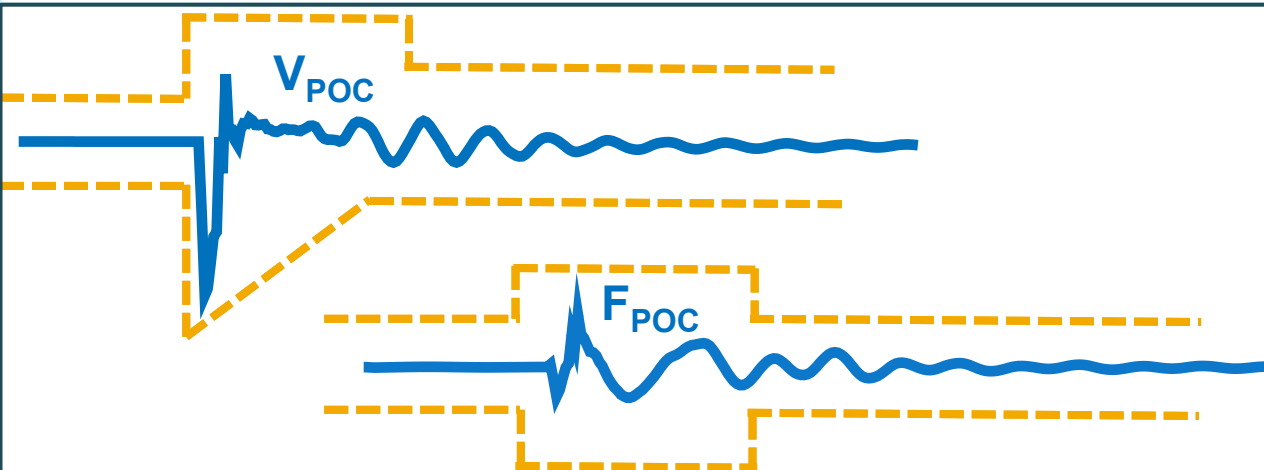
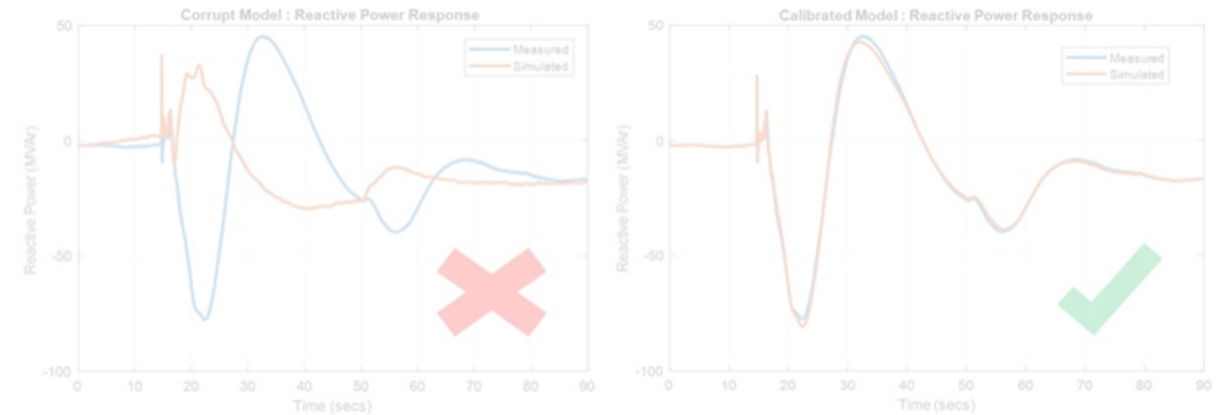


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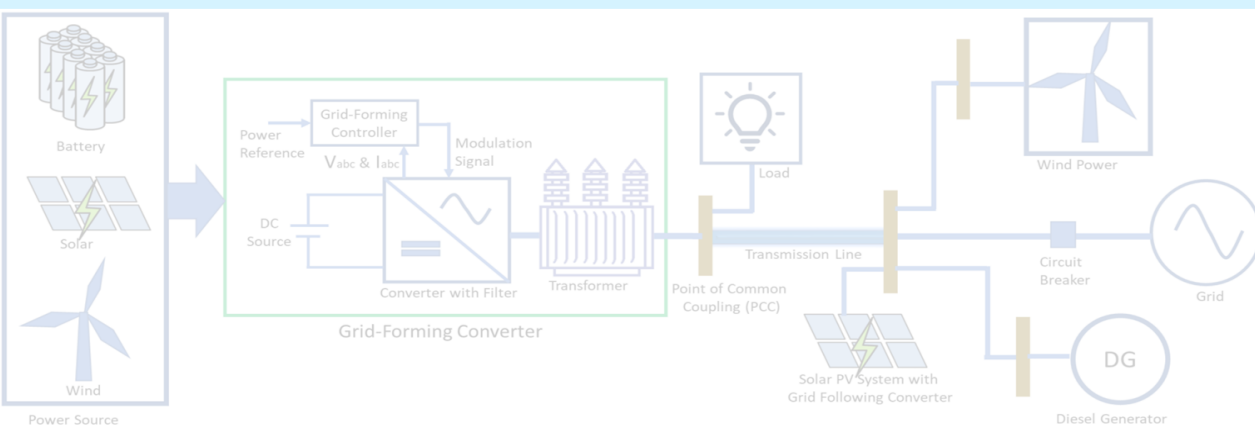


Is the system's behaviour in compliance with grid performance standards (DMAT, GPS, etc.)?

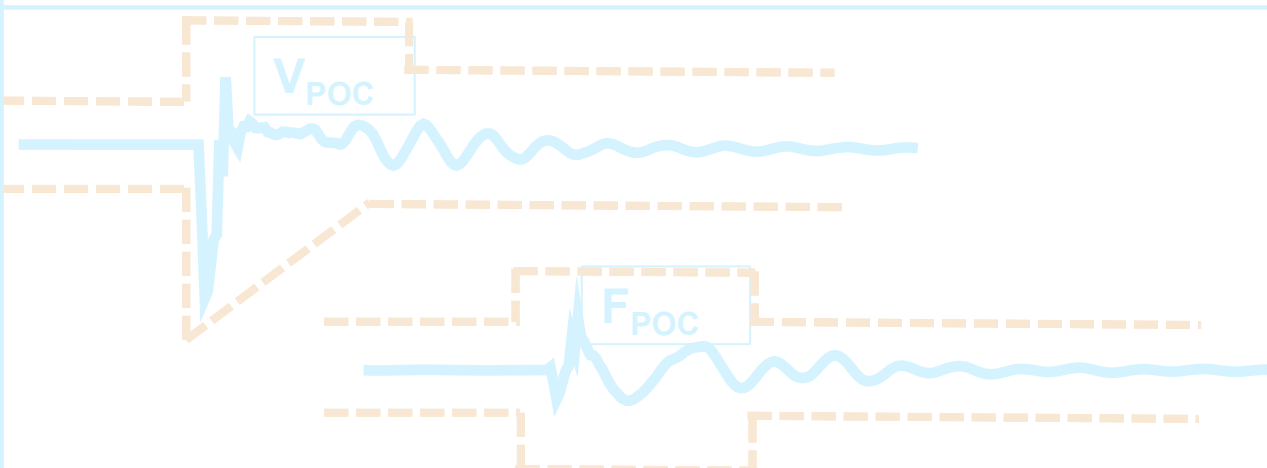
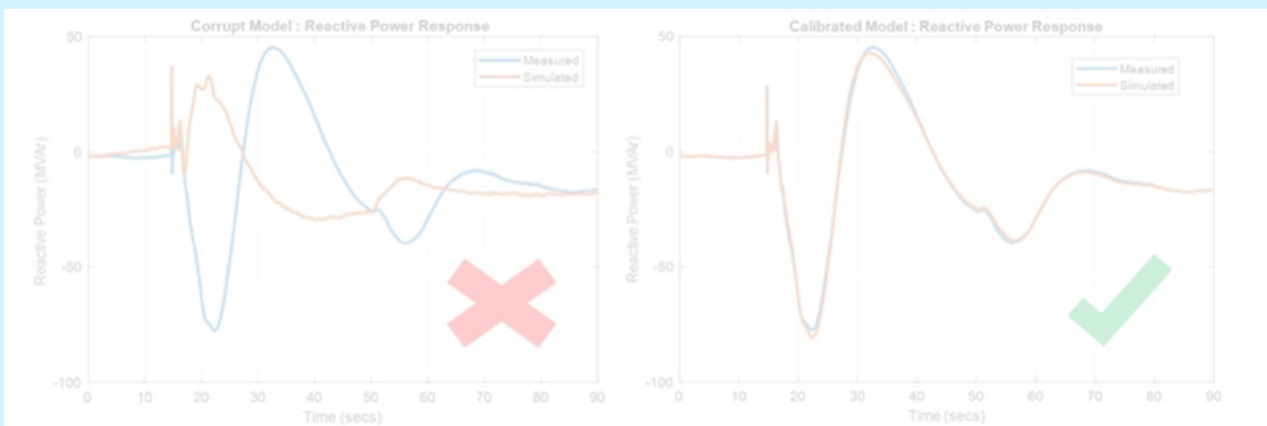


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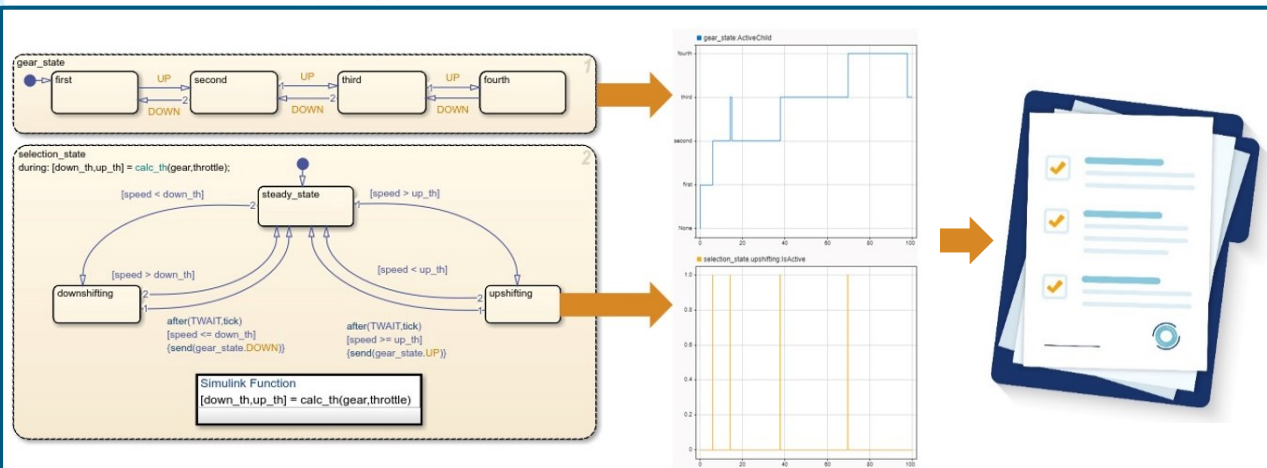
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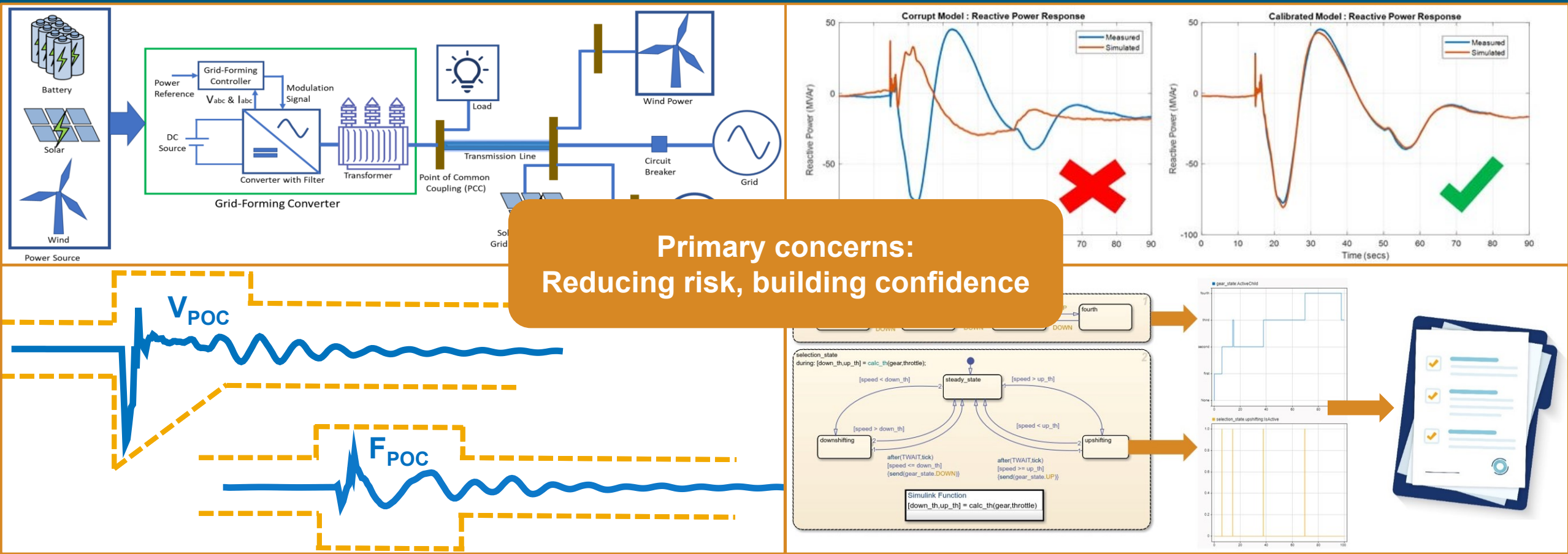


How to automate grid connection studies, performance validation, and documentation?

# Increased influx of grid-scale renewable energy installations requires addressing many questions to ensure grid reliability

Is the overall system robust and reliable?

How to validate the asset models are accurate?



Primary concerns:  
Reducing risk, building confidence

Is the system's behaviour in compliance with grid performance standards (DMAT, GPS, etc.)?

How to automate grid connection studies, performance validation, and documentation?

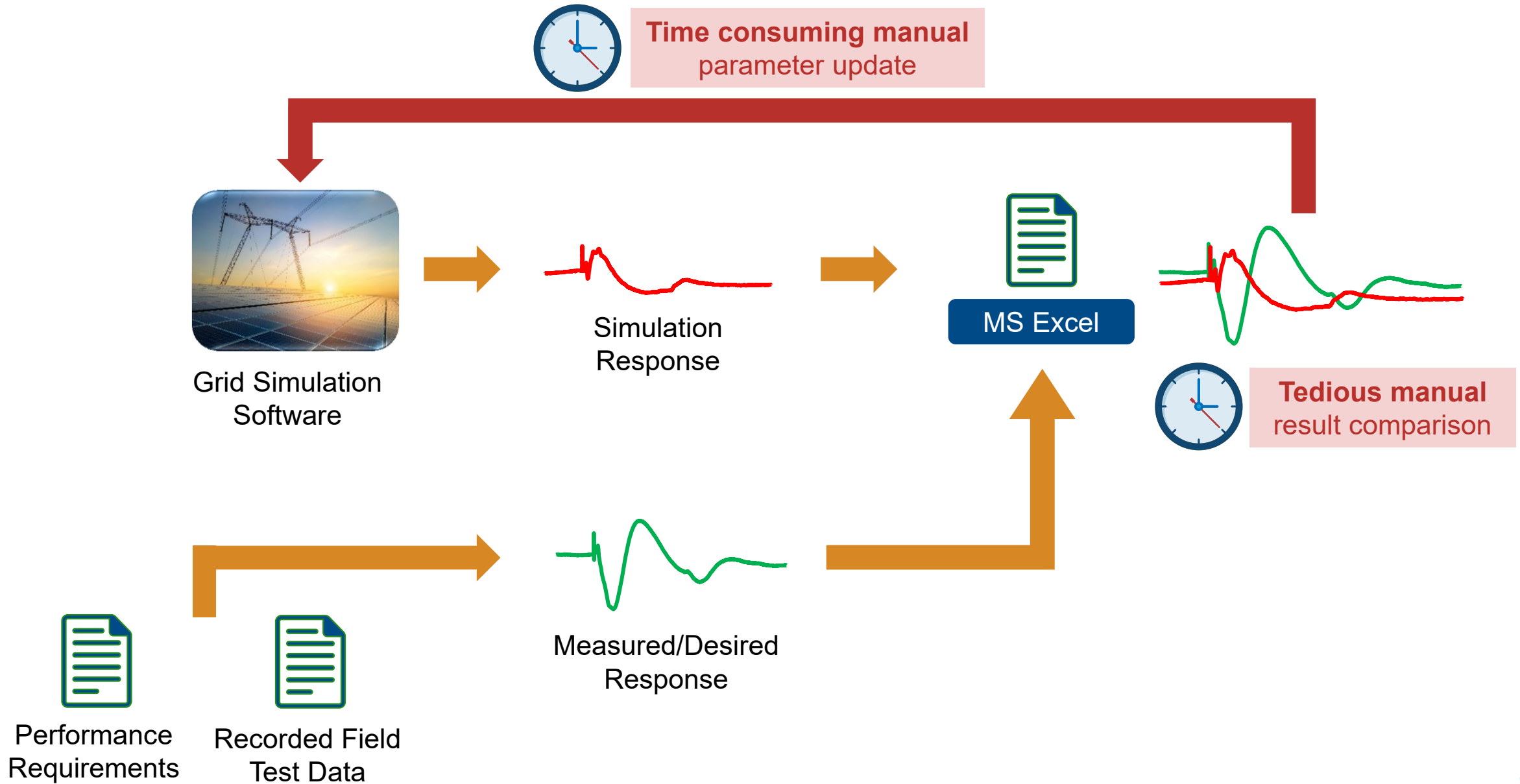
# AEMO initiatives to address the influx of renewable energy installations

- Dynamic Model Acceptance Test Guidelines (DMAT)
  - Numerical robustness
  - Accuracy
  - Consistency
- Generator Performance Standards (GPS)
  - Site specific requirements (grid strength, SCR)
  - Generator type and size specific requirements
- R0, R1, R2 validation and ongoing compliance studies

**Typical workflows are manual, time-consuming and susceptible to errors.**



# Inefficient manual workflow for model validation and compliance studies



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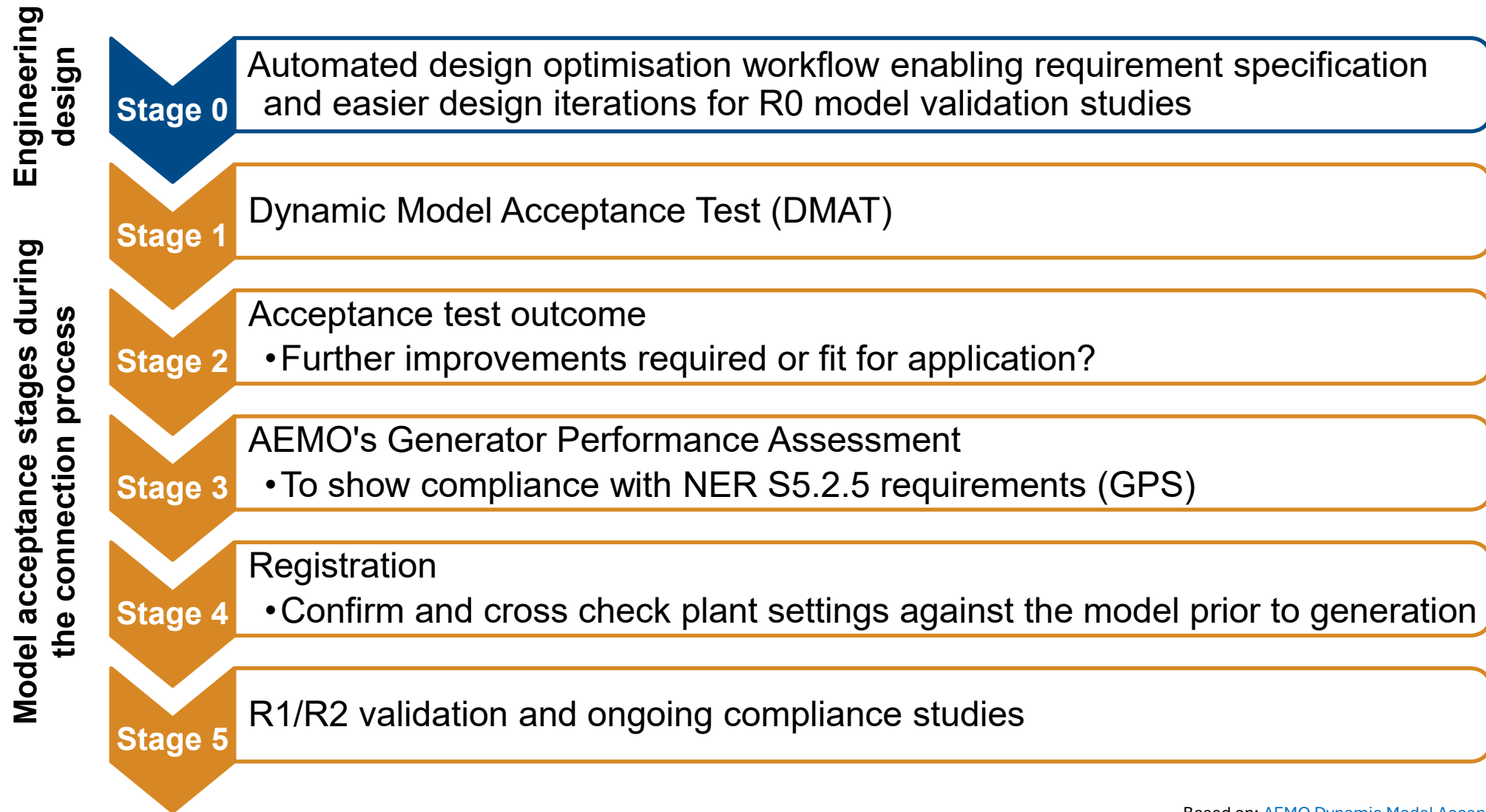
**Typical workflows are manual, time-consuming and susceptible to errors.**

**This underscores the need for an efficient approach to reduced time, effort and resource commitment.**

# Automated workflow objectives

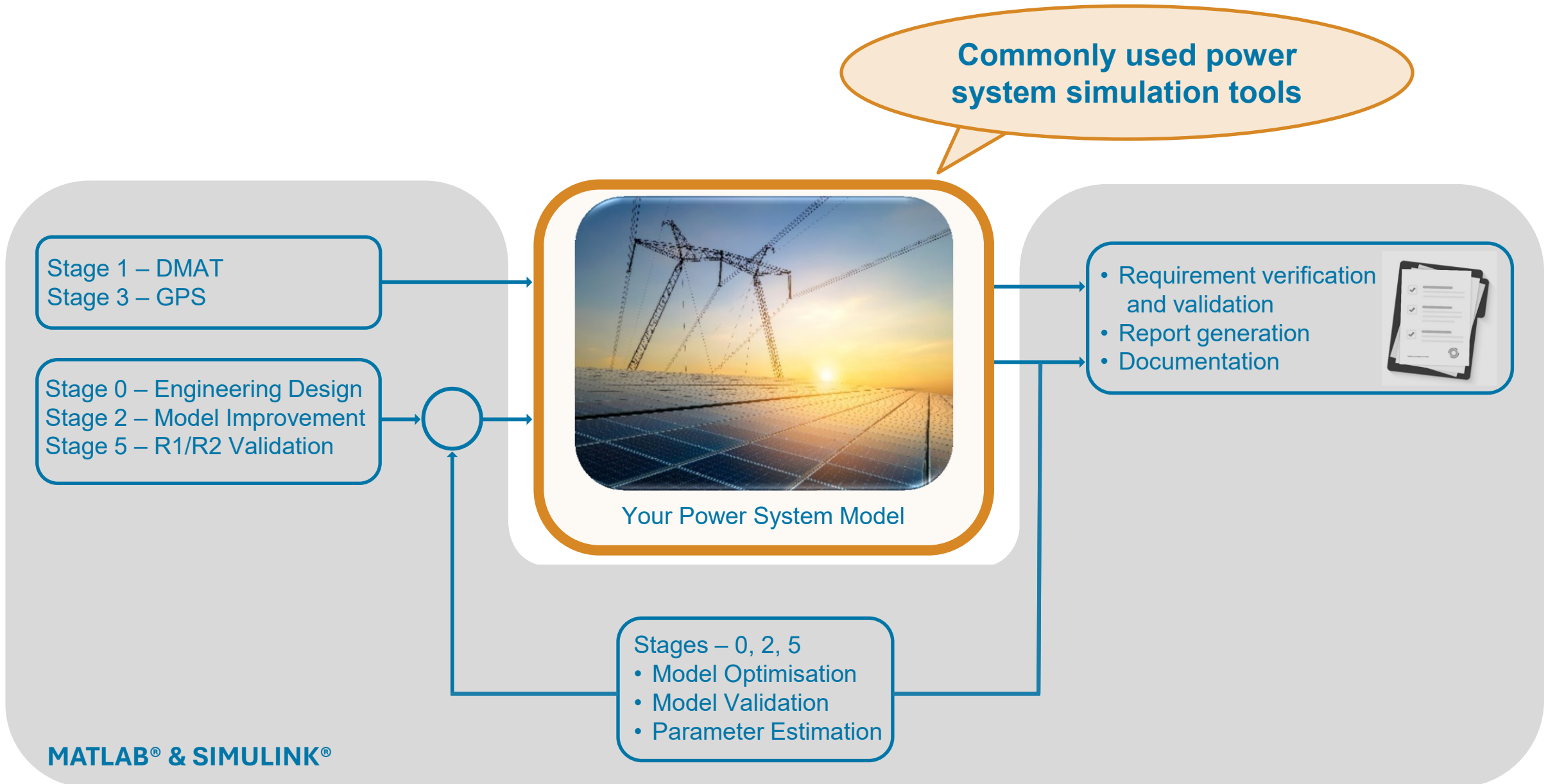
- Support commonly used platforms across the industry
- Automate AEMO DMAT /GPS requirement testing, validation, and documentation
- Automate R0, R1, R2 validation and ongoing compliance studies
  - Model validation studies
  - System response optimisation

# Automated workflow to perform AEMO recommended grid-connection studies



Based on: [AEMO Dynamic Model Acceptance Test Guideline](#)

# Automated workflow to perform AEMO recommended grid-connection studies

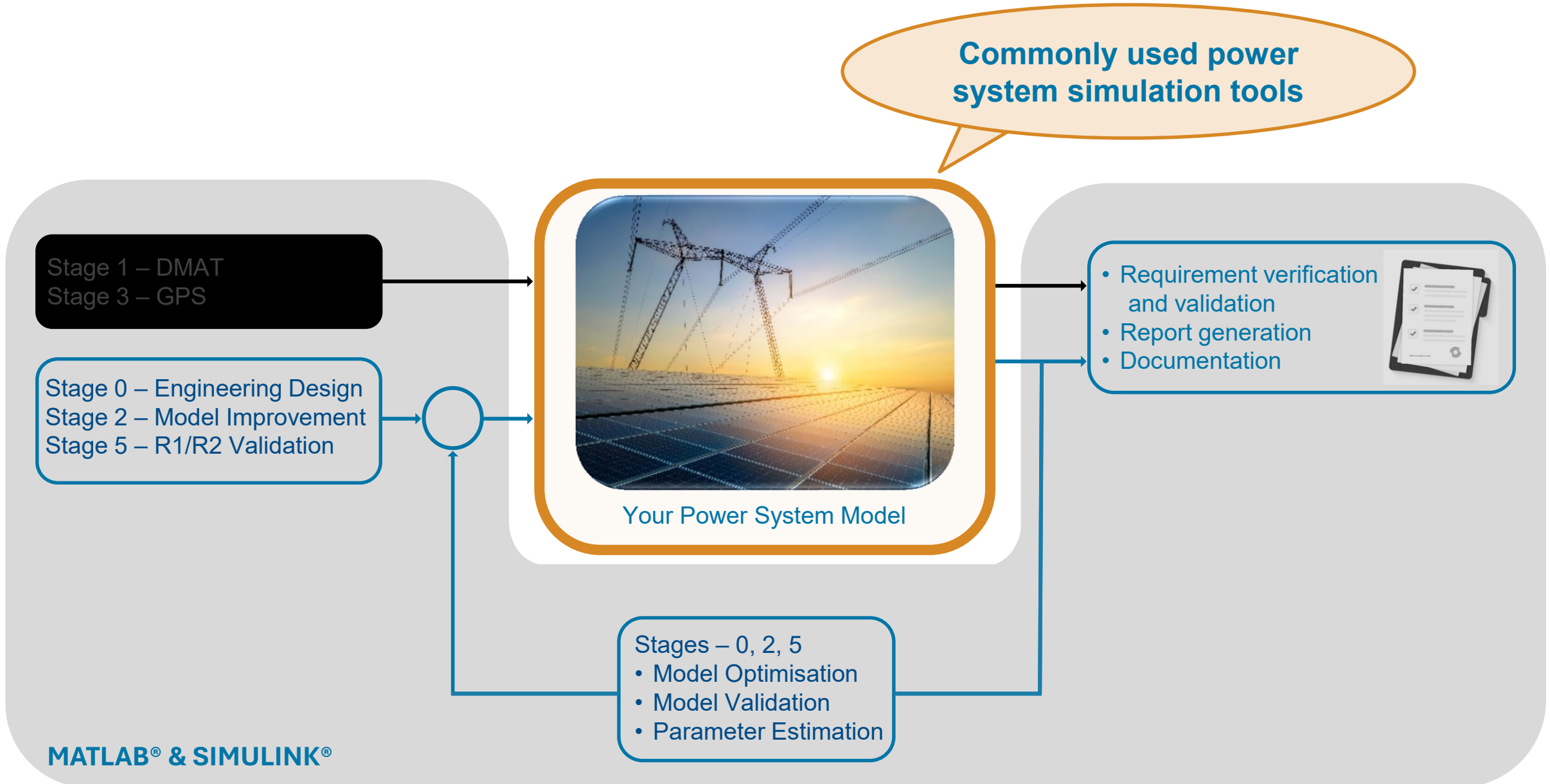




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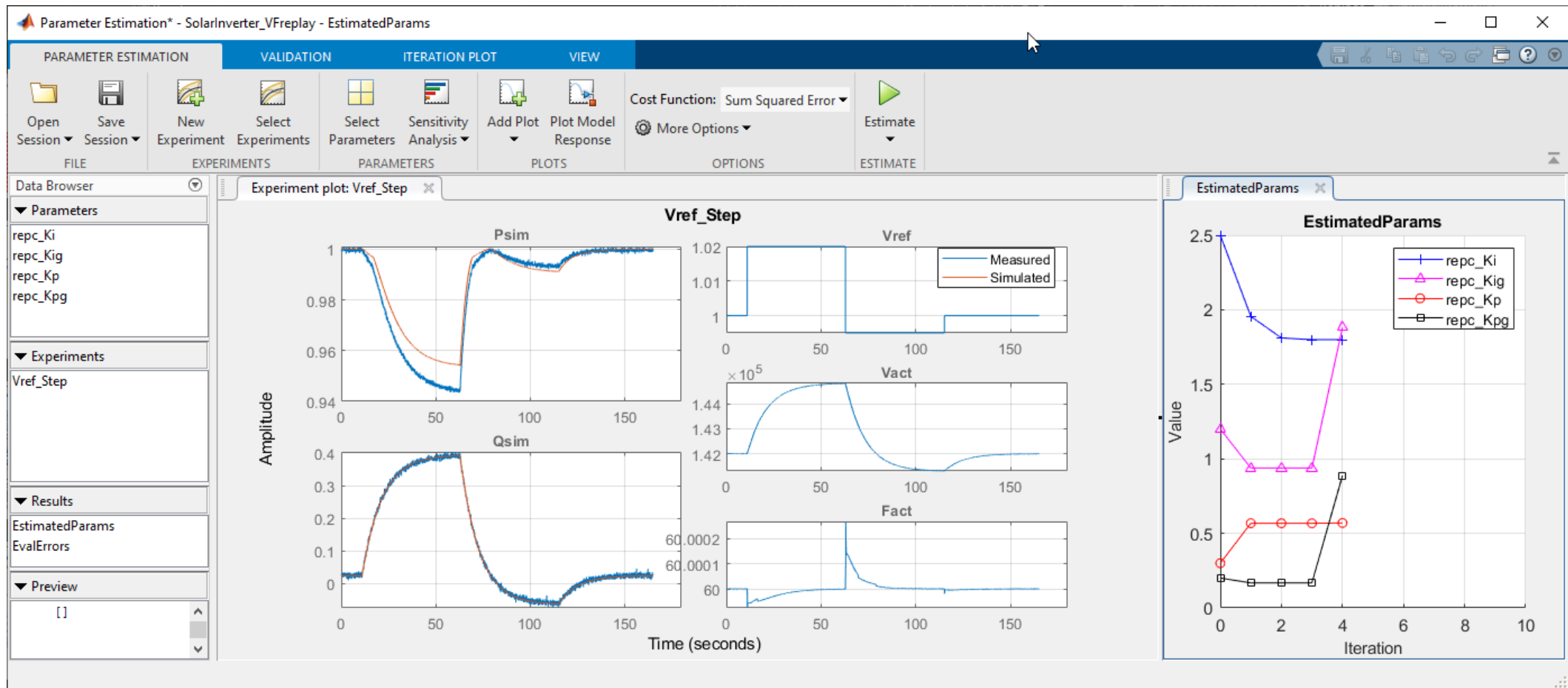


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# Perform Automated R0, R1, R2 Model Validation

- Import and preprocess measured data.
- Find the most influential parameters to optimise (with the Sensitivity Analyzer).
- Optimise model parameters and monitor optimisation progress.



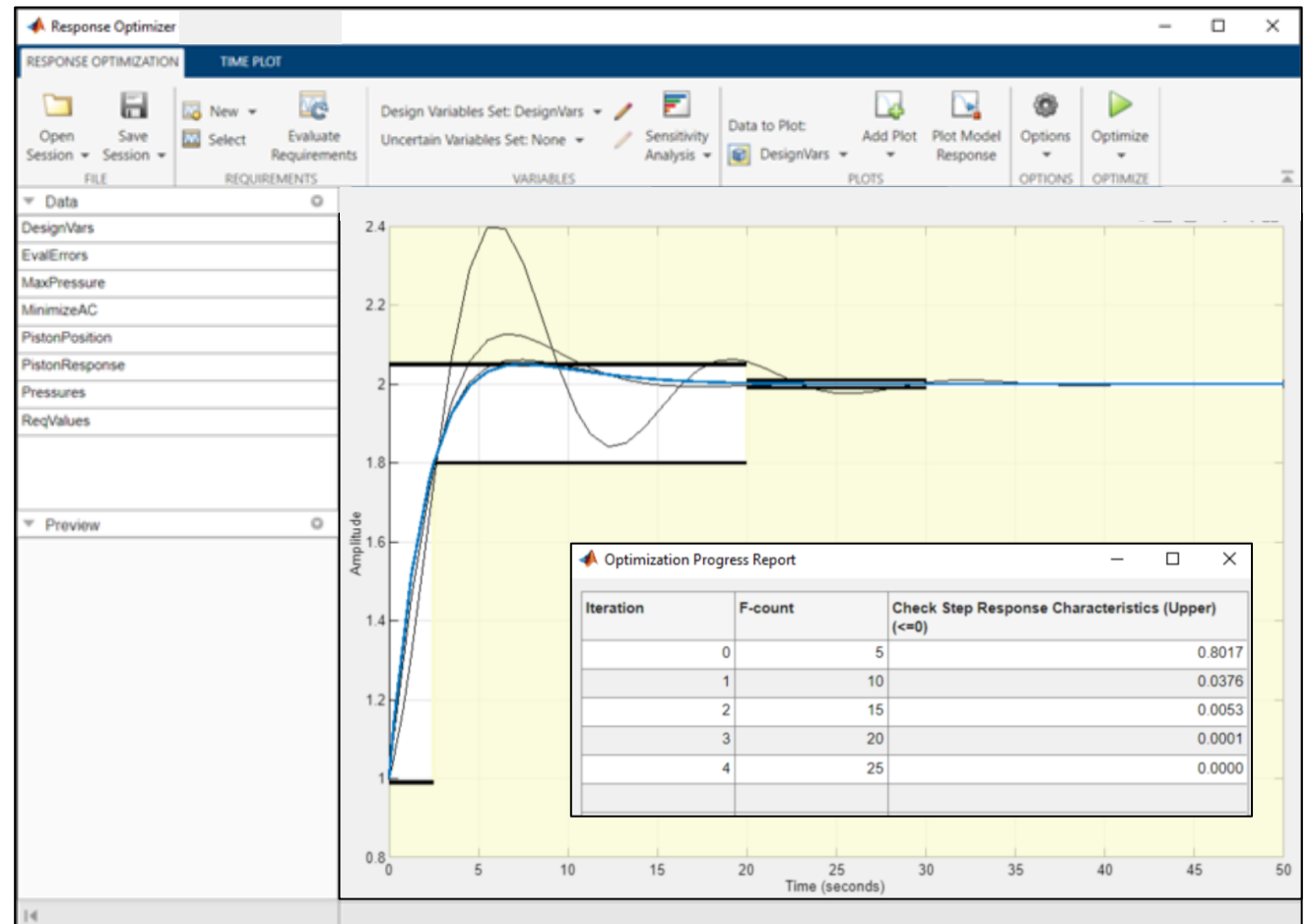
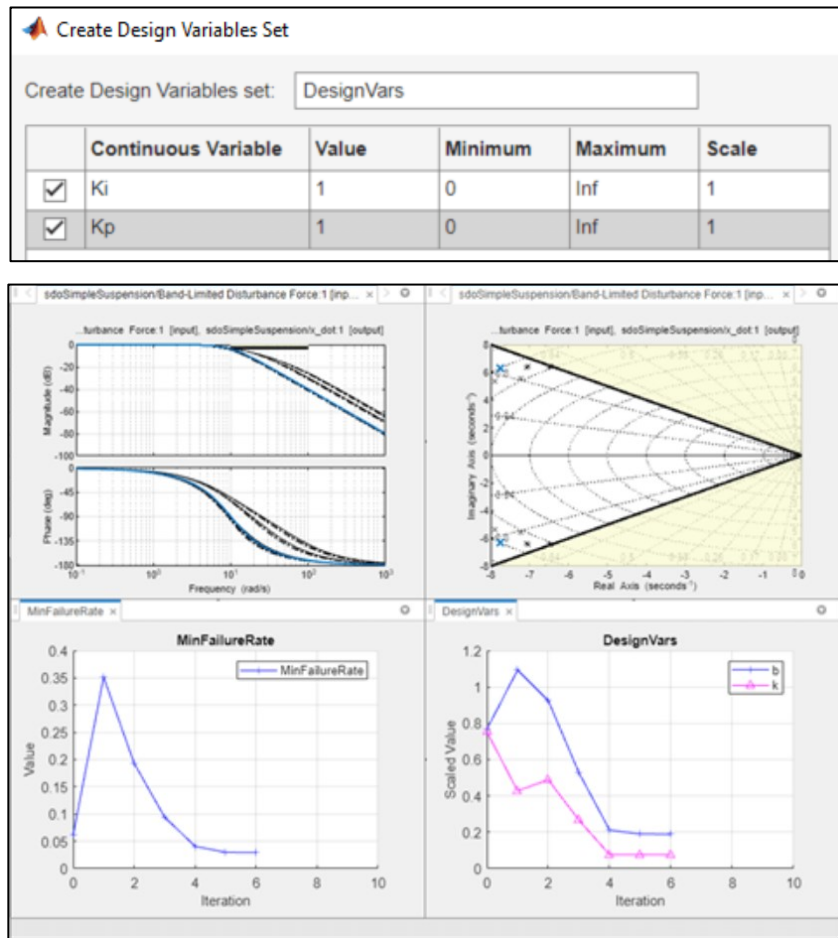
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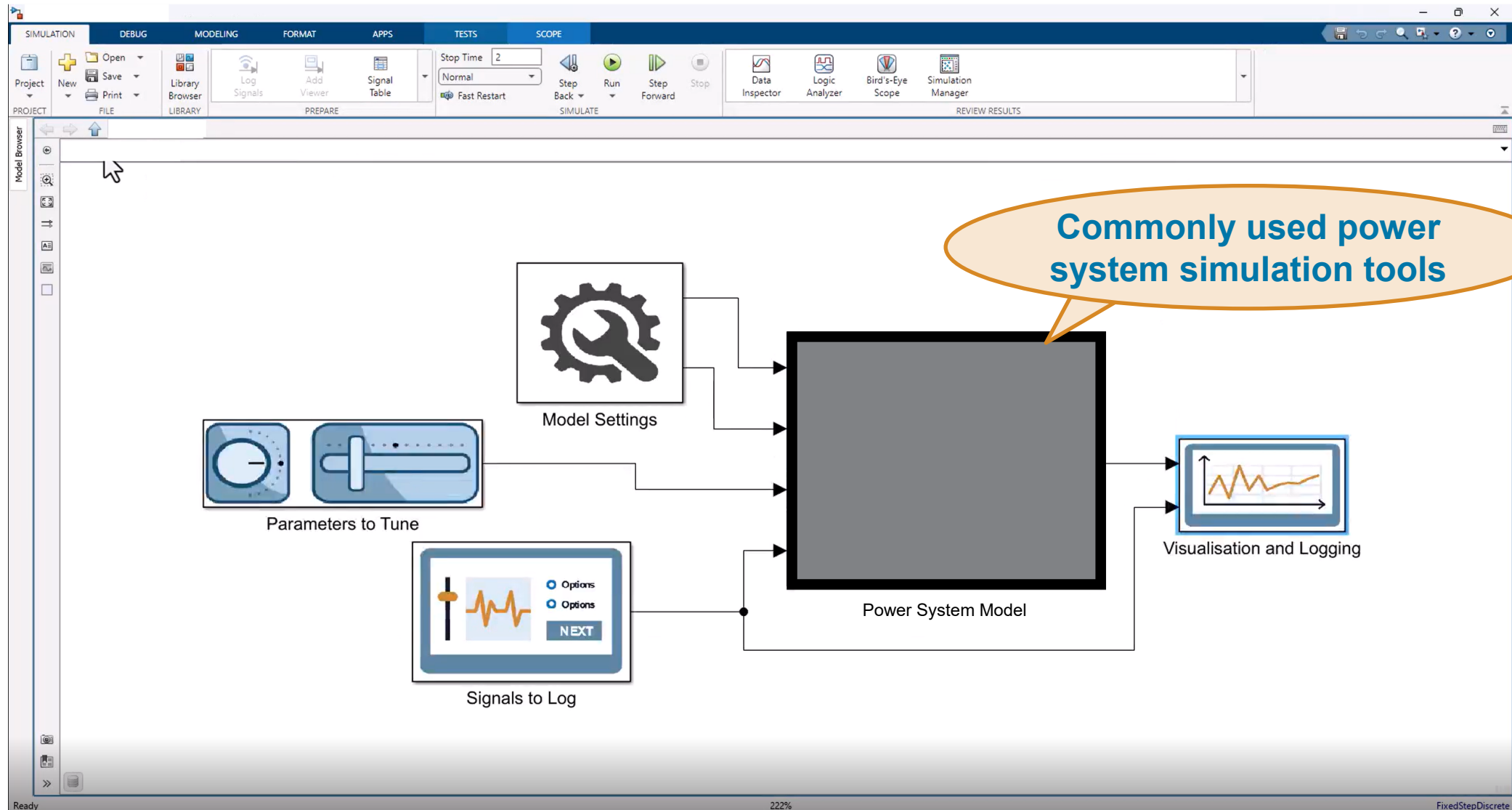


# Perform Automated R0, R1, R2 Response Optimisation

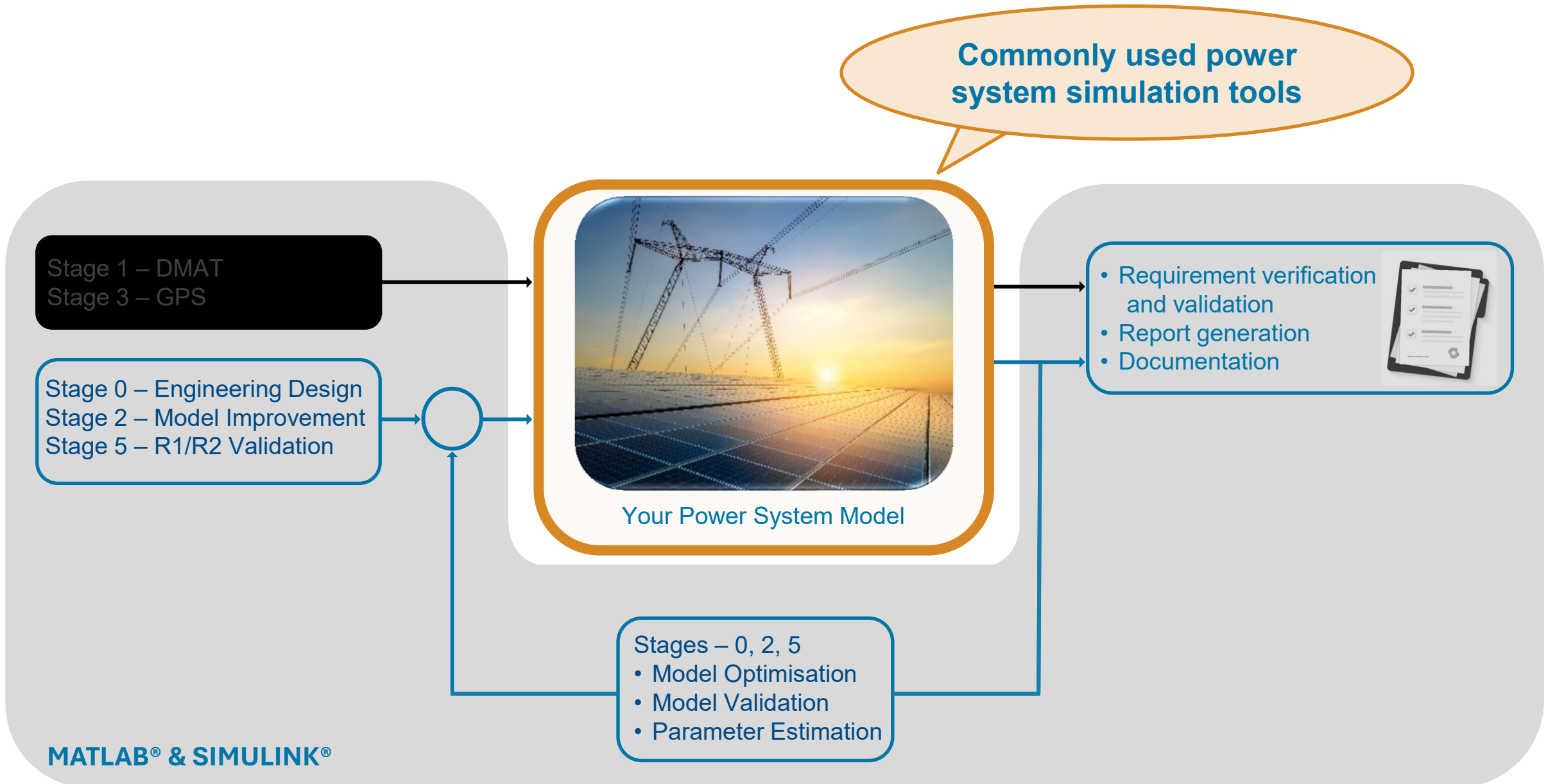
- Specify design requirements.
- Find the most influential parameters to optimise (with the Sensitivity Analyzer).
- Optimise model parameters and monitor optimisation progress.



# Model and simulate in commonly used power system simulation tools across the industry



# Automated workflow to perform AEMO recommended grid-connection studies



# Value of automated workflow



Automate running AEMO recommended R0/R1/R2 validation and ongoing compliance studies.



Easily integrate with leading industry modelling tools.



Reduce project risk and increase system confidence by optimising and validating your power systems models to reflect reality.

# Looking to boost productivity in your workflows? Explore our tailored offerings.

- **One-time consulting engagement** to help you get started and tailor the automated workflow to your organisation.
- **Annual licensing** of the MathWorks platform to support and sustain your workflow improvements.
- **Training and enablement support** to upskill your team and ensure rapid adoption of the new workflows.

Aligns with your needs? Contact us.



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