

The Ahuora Platform: A New Online PSE Toolkit Powered by IDAES

Stephen Burroughs, Ben Lincoln, Tim Walmsley (assisted by the wider Ahuora team of 40+ engineers) School of Engineering, University of Waikato







UNIVERSITÄT PADERBORI

Team Ahuora



University of Maribor

11 International collaborations

- 11 Academic faculty 22 PhD researchers
- 2 Masters researchers
- 7 Part-time software dev.

UORA



Project Ahuora: 2020 - 2027

Mission: To deliver an **adaptive multi-scale digital twin platform by 2027** that accelerates the transition to sustainable process heat.

Motivations:

- Reduce the expertise required to apply these advanced analysis tools
- Customise analysis tools for non-continuous processing sites
- Embed concepts and data specifically for the energy transition



Project Ahuora: How?

By leveraging **Software Engineering methodologies** to develop an integrated platform for **Process System Engineers**

Core outcomes:

- Development of integrated and intuitive User Interfaces to facilitate access to design and analysis tools.
- Abstraction of complex model synthesis into backend processes.
- Standardised structures and APIs to manage data communication.
- Containerisation strategies to achieve performance.



Progress so far

- Initial vision for Alpha version in July 2022, with development commencing in November of that year.
- Development of the Beta version has been underway since December of 2023.

Alpha Version	Beta Version			
Requirement Solicitation	Initial Deployment	Flowsheet Modelling	Synthesis and Integration	Operation and ML Modelling
Functional Frontend	Robust Prototyping	Initial IDAES Core	Pgraph Python	IDAES PySMO
Containerised Solver	Data Structures	Unit Operation Expansion	Pyomo GDP	PINNS
	UI Overhaul	Property Packages	OpenPinch	Live Data
	Kubernetes Deployment	Dynamic Modelling	OpenHENS	Data Shadowing
		Energy Resources	OpenHYRES	COVERT

