

Ahuora Digital Twin Platform Pinch Module Integration



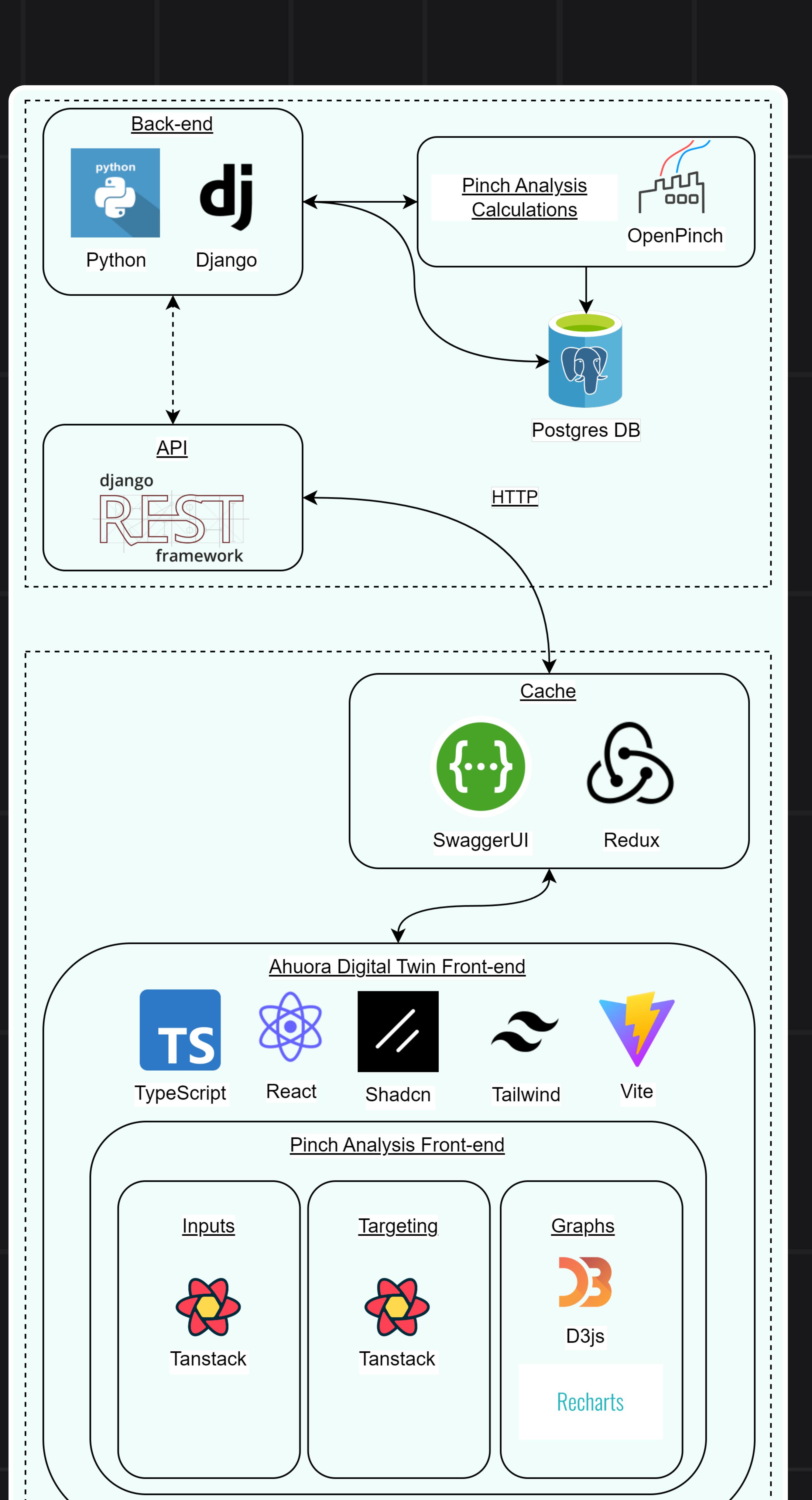
Author: Ethan MacLeod Supervisors: Mark Apperley, Tim Walmsley

The Motivation

New Zealand aims for net-zero GHG emissions by 2050 [1], with a major focus on the energy sector, which contributes 39.8% of the country's total emissions. Notably, 28% of this is from industrial process heat generation, producing 9 million tonnes of GHG annually, making it a critical area for emission reductions [2]. However, outdated infrastructure presents a significant barrier to this goal.

So what can be done?

Instead of relying solely on more efficient resources, the focus can be on optimizing existing systems to reduce heat usage, leading to lower GHG emissions per plant. One effective methodology is Pinch Analysis, which identifies targets for heat recovery by analyzing the energy flow within a process.

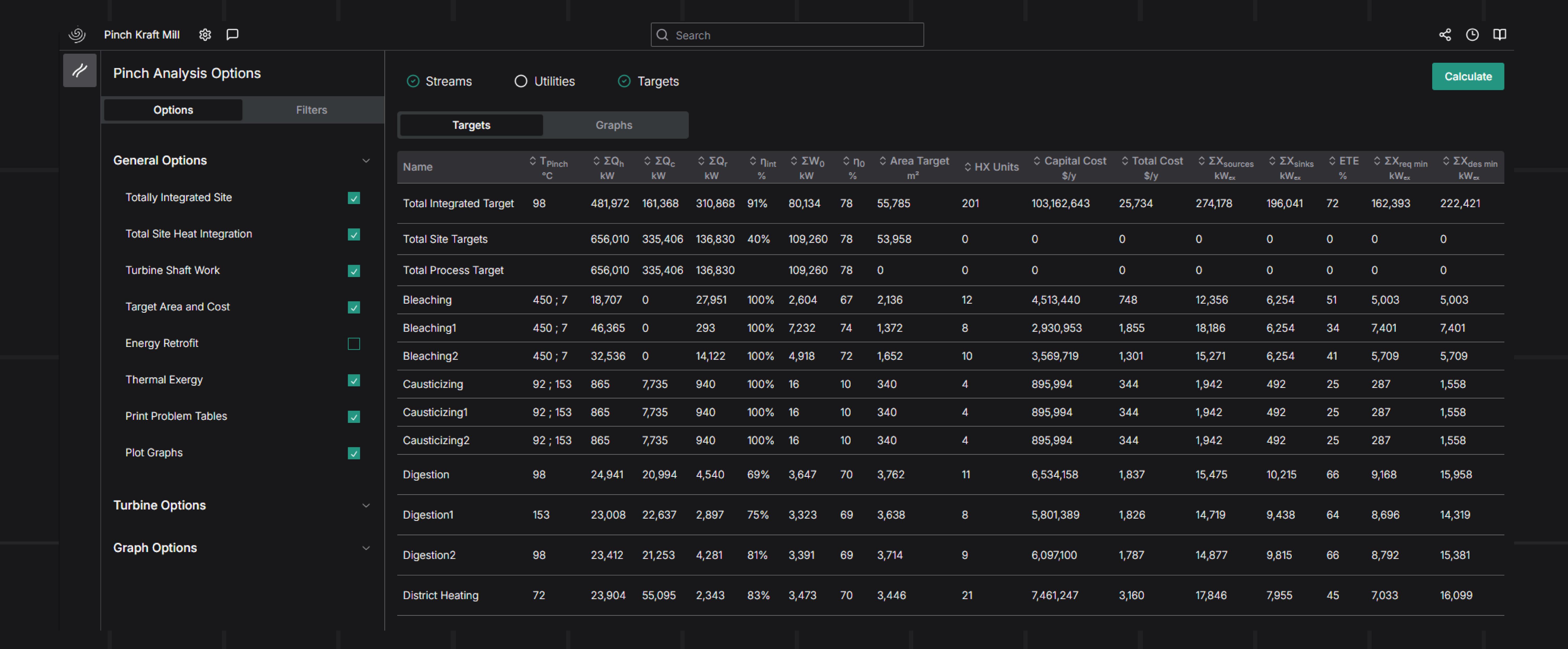


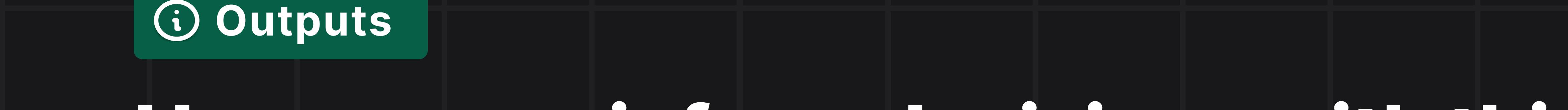
(i) Context

How does this module fit in with the rest of the Ahuora Digital Twin Platform?

The Pinch Analysis system has been designed to integrate with the Ahuora Digital Twin **Platform**. The calculations required for finding the various pinch targets and outputs has been migrated into its own service on the **Django** back-end - with endpoints created on the API for initializing the targeting, and data structures in the database. On the frontend, the pinch system is logically separated into its own User Interface accessible through a menu bar.







Real-World Example **Craft Mill** Total Integrated Target CC Total Integrated Target GCC