

APS1049 Team 1 Digital Twins Executive Summary

Digital twins have arisen to the public consciousness in recent years. There is a significant increase of demand of digital twins. The main purpose of this report is to collaborate with Deloitte and explore the use cases, vendors and technology of digital twin focused on power utilities and renewables sectors.

We find that digital twins can help users in the following perspectives:

- 1) Optimize the performance of power infrastructure.
- 2) Minimize waste byproducts and power loss in power generation.
- 3) Facilitate a transition to decarbonization, decentralization and digitalization which are the leading trends in the Power and Utilities sector.

After our research, we explore use cases of applications of digital twins, define the vendor market for digital twins and suggest potential interested clients. Some areas digital twins help improve include but is not limited to, operations performance management, power plant design and asset lifecycle management in the Power and Utilities industry. It does so by adding value across the Power and Utilities value chain by delivering understanding, forecasting and control of the physical system to an operator. However, as we find, digital twins in our target industry are not fully mature. There are limited use cases disclosed by vendors' and the Power and Utilities industry only takes up a small portion of the market compared with the manufacturing and automotive industry. We recommend General Electric and Aveva as vendors of interest and suggest contacting them for more information.