# Project Profile

IDT4GDC

Intelligent Digital Twin Platform for Climate-Neutral Data Centers

Empowering sustainable data centers with AI and Digital Twin technology

With AI-driven Digital Twin solutions, iDT4GDC is **pioneering the transformation** of data centers into **energy-efficient, sustainable, and carbon-neutral** operations.

ADDRESSING THE CHALLENGE

Data centers are crucial for the digital economy but are also one of the largest consumers of electricity and significant contributors to carbon emissions. Traditional management approaches often lead to inefficiencies, excessive cooling, and resource wastage, making sustainability a pressing issue. While AI and automation offer potential solutions, their adoption in mission-critical infrastructure remains limited due to reliability concerns and lack of real-time optimization capabilities.
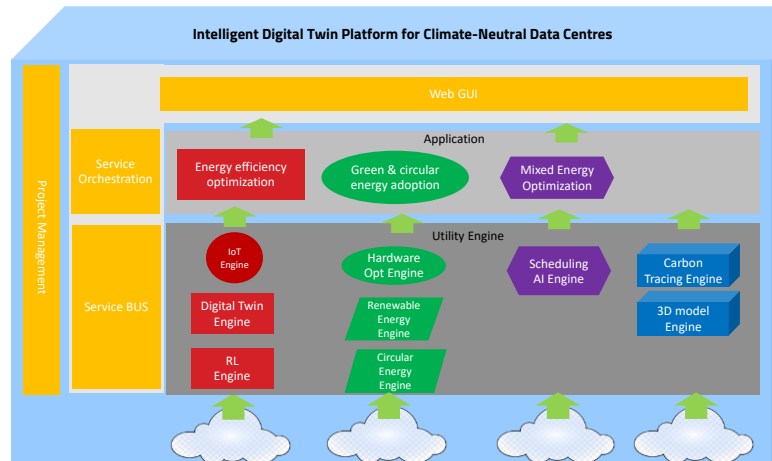
PROPOSED SOLUTIONS

The iDT4GDC project leverages cutting-edge **AI-driven Digital Twin** technology to optimize data center operations and sustainability performance. Through a collaborative consortium spanning four countries (Singapore, Turkey, United Kingdom, and Canada), this project aims to revolutionize data center management by:
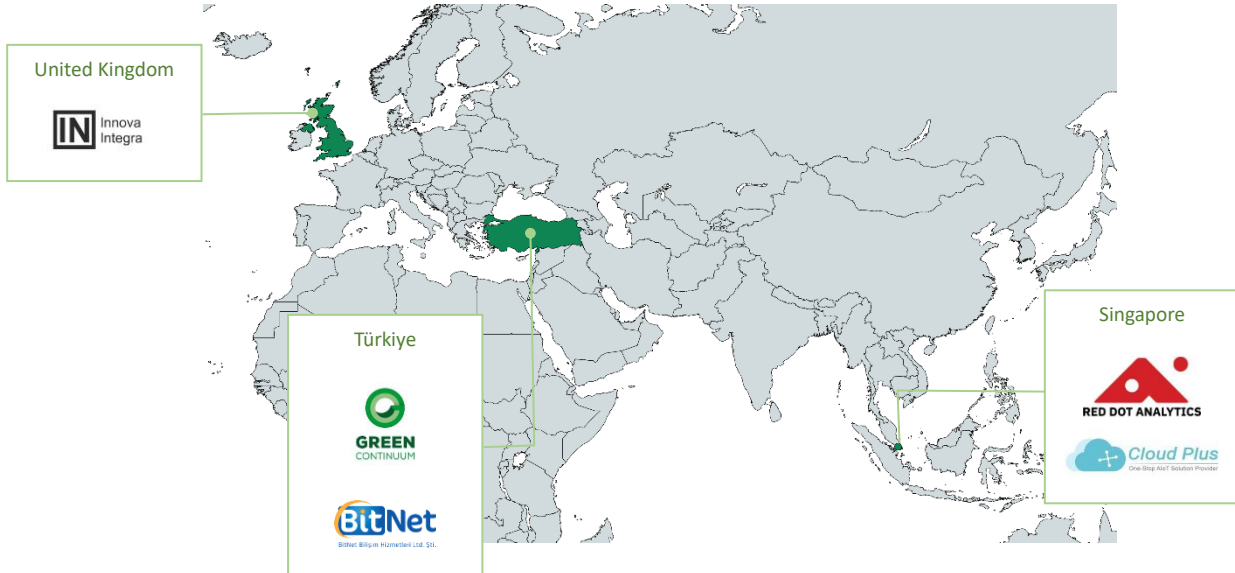
- **Real-time Digital Twin Simulation**: Creating a virtual representation of data centers to predict, monitor, and optimize energy consumption.

- **AI-Powered Sustainability Analytics**: Utilizing machine learning to enhance efficiency, reduce cooling demands, and maximize renewable energy use.

- **Smart Resource Allocation**: Implementing AI-driven scheduling to balance workloads and minimize environmental impact.

- **Carbon Footprint Reduction**: Supporting compliance with international sustainability frameworks such as the EU Climate-Neutral Data Center Pact.

- **Open-Source, Scalable Platform**: Providing a **Platform-as-a-Service (PaaS)** model to enable widespread industry adoption of real-time optimization capabilities

PROJECTED RESULTS AND IMPACT

The goal of iDT4GDC is to develop an **intelligent, automated, and sustainable** approach to data center management, targeting:

- **Reduction in Power Usage Effectiveness (PUE) from 2.07 to 1.35** in tropical environments.

- **Energy cost savings of up to 67%** in cooling operations.

- **80% adoption of renewable energy** for data centers by 2030.

- **20% reduction in carbon emissions** through AI-optimized resource allocation.

- **Improved Overall Equipment Effectiveness (OEE)** through predictive maintenance and AI-driven fault detection.

United Kingdom

IN Innova Integra

Türkiye

GREEN CONTINUUM

BitNet
BitNet Bilişim Hizmetleri Ltd. Şti.

Singapore

RED DOT ANALYTICS

Cloud Plus
One-Stop AIoT Solution Provider

Project ID	**Project Start**	**Project Website**
SUS2022-042	July 2023	www.idt4gdc.com

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