

Hi, my name is Sergio and I'm an expert architect in Everilion. Over the last three years, alongside Vicente, a talented building architect and a close friend, we developed RL-Energyplus in our free time. This is a personal project result of my increasing interest in artificial intelligence, and our ambition to apply deep reinforcement learning in the fight against climate change. This is a journey of curiosity, engagement and collaboration. From just an idea to a groundbreaking platform, RL-Energyplus is ready to show what it can do. Join us and let's take a look at how this project is set to change things for the better.

RL-Energyplus is a revolutionary platform at the forefront of addressing the climate crisis through AI in building management. Buildings contribute to 40% of global emissions, presenting both a challenge and a significant opportunity. Governments worldwide are enacting stringent environmental regulations and offering economic incentives, setting the stage for transformative solutions. The breakthrough in deep reinforcement learning holds promise. These algorithms, evolving from video games to unprecedented learning capabilities, offer hope for optimising energy consumption and reshaping our built environment efficiently. However, realising this potential requires a seamless collaboration among energy experts, architects, and AI programmers, uniting diverse disciplines to solve a common problem.

Enter RL-Energyplus, a meeting point for collaboration. At its core, RL-Energyplus integrates with Energyplus, the renowned energy simulation engine for buildings backed by the US government. It radically simplifies the training of AI agents to address multiple energy optimization problems. With MLOps capabilities embedded in its framework, RL-Energyplus facilitates experiment tracking, model registry, versioning, and detailed logging of training processes. This infrastructure forms the backbone of a platform committed to iterative progress and learning.

RL-Energyplus isn't just a concept; it's making strides in real-world scenarios. Our initial experiments echo those by big players like Amazon Web Services, that anticipate significant energy savings in buildings. Our AI platform has proven itself highly efficient in developing deep reinforcement learning training environments, with most models brought to life a few days after the digital twin is available.

In an exciting collaboration with the University of Alicante, we've ventured into a unique project at the 13th century San Juan del Hospital Church in Valencia. Here, we're regulating CO2, temperature, and humidity in a historic setting to solve a serious overheating problem. AI-driven patterns offer guidance on actuator use, guiding human interaction with passive elements like doors and fans. We anticipate even greater impact with the integration of active elements like HVAC systems. Also, at the Alicante's Provincial Council Auditorium, we're enhancing audience comfort by

controlling HVAC temperature setpoints using preliminary digital twin data, pointing towards a future where more ambitious objectives become achievable.

The project is on the cusp of a transformation, evolving from a personal self-development project to a corporate endeavour, willing to join forces with technology or energy industry leaders like NTT Group or others, to realise its full potential and translating these humble impacts into more significant and transformative outcomes.

As we break free from existing constraints, platform maturity will be increased by its application to a widening array of real-world scenarios and the integration of state-of-the-art technologies, including Large Language Models, like these powering ChatGPT, to facilitate the preparation of scenarios and to refine reward functions used for agent training.

Looking ahead, we anticipate further market expansion as we continue to apply RL-Energyplus to new problem scenarios, including water management. By creating multi-domain models, we aim to broaden our impact beyond the realm of built environment design and management. This growth underscores our dedication to not only adapting to the current landscape but also pioneering the future of sustainability initiatives beyond energy optimization.

Thank you for joining us in this journey. We hope for your support as we continue to evolve and expand this platform. Together, let's help RL-Energyplus achieve its full potential, driving forward transformational change against the climate challenge.