RESEARCH LINE 7A	
COMPANY	**Iberdrola**
PhD THESIS SUPERVISOR (UPM)	Prof Dr. Bernardo Llamas Moya *Mining and Energy Engineering School* *Mining and Geology Engineering Department*
PhD THESIS CO-SUPERVISOR (COMPANY)	Dña. Beatriz Crisostomo Merino *Head of Innovation Management Iberdrola*
DESCRIPTION OF THE PhD THESIS PROJECT	**Digitalization. Metrics for measuring the return of digital investments in the electric power sector.** The energy landscape is evolving. Consumers and businesses are demanding more sustainable energy options and transformative initiatives. Simultaneously, electric power companies are looking for new approaches to improve grid performance and prepare for a cleaner, distributed, and digitalized energy future. Companies that prioritize the integration of new technologies into their existing infrastructures and operations, getting superior performance compared to their competitors. Since reliability, resilience, and efficiency are their current priorities, they defer new capital investments in grid assets by optimizing existing equipment. Additionally, grid and infrastructure skills are critical to their future success, so they're focusing on upskilling existing employees on emerging technologies. What justifies the need of a roadmap based on a selection of metrics for building the electric power sector of tomorrow through logical, extensible investments today. The main goal of digitalization of the electric power sector is to intelligently integrate, organize, and manage sources of renewable energy generation—which requires quickly assess and respond to real-time grid conditions. The motivation to increase transmission reliability is threefold: ease congestion, allow for increases in demand, and provide a greater degree of security. Energy Storage technologies arise as an innovative solution to increase the load factor of wind and solar energy. Those technologies will redefine a new electricity network with more distributed energy sources. To understand and measure how all those digital investments (IoT, blockchain, and others) in can return in the electric power sector, a set of metrics need to be displayed and tracked. For meeting that need, the methodology of this project has the goals of: - Defining a near-future electricity system based on renewable energy and different energy storage solutions. - Reviewing common metrics already tracked by the company and by the electric sector related to digitalization using benchmarking. - Providing an evidence-based set of metrics for improving the measurement of the digital investments that the company is making toward digitalization, based on company activities - Providing a roadmap of digital investments vs. return on the business based on the metrics selected to build the electric power sector of tomorrow through logical and extensible investments - Providing an analysis of how those measurement metrics and the digital investments made by the company are aligned to the Sustainable Development Goals (SDGs), and if they are contributing to the company's performance, mainly the SDGs 7 - Affordable and Clean Energy, 8 – Industry, innovation and infrastructure and 13 - Climate Action.

	- Being compatible with the types of data and geographical resolution of publicly disclosed corporate data. - Being transparent, verifiable, and replicable. - Functioning consistently and uniformly for most nations of the globe. - Being able to be updated when new data or model results are available. Taking into account differences in the geographical context of company activity, using a simplified method that does not introduce barriers to adoption.
Tentative SECONDMENT(S)	Georgia University. Wageningen University. Dublin University. Exeter University. Leoben University.
REQUIREMENTS FOR CANDIDATES	Degree of Energy Engineering. Degree of Environmental Engineering. Computer Science knowledge. Business knowledge or MBA is recommended. English, C1. Spanish, B1. Teamwork and proactive Skills.