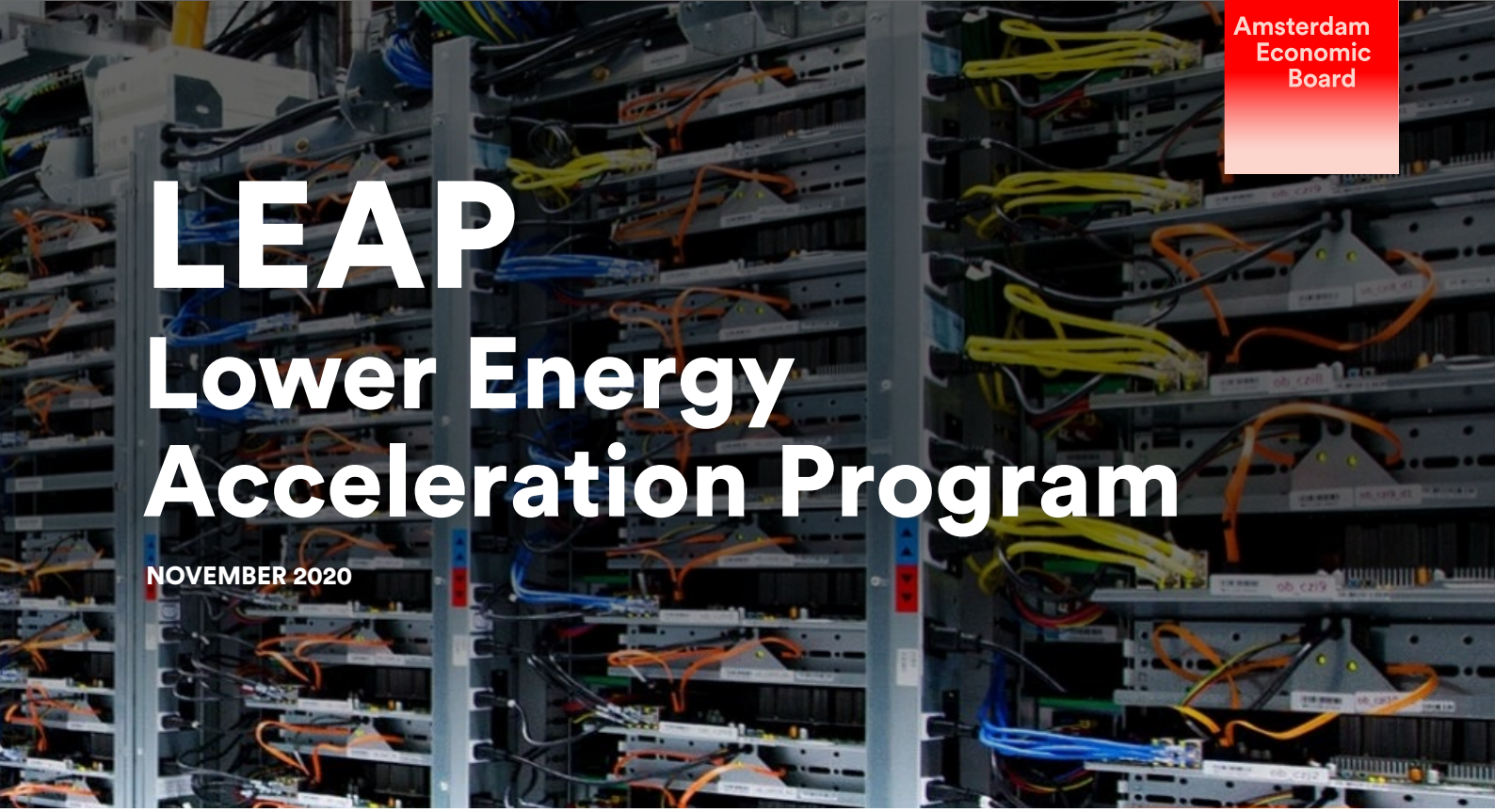

Amsterdam Economic Board

LEAP
Lower Energy Acceleration Program

NOVEMBER 2020

What is LEAP?

LEAP is a platform supporting the future generation of data centres. The aim is to accelerate the transition to a **sustainable digital infrastructure** in which we integrate innovative developments at the **heart of our energy system** and provide a solution for **spatial planning** with **circular use of materials.** Started in the Amsterdam Metropolitan Area (AMA), a vital global internet hub for the international data centre sector, LEAP strives to make a national, European and global impact.

Founded by the Amsterdam Economic Board, LEAP began mid-2019 as a coalition of data centres, their customers, business end-users, telecom providers, hardware suppliers, network organisations, knowledge institutions, start-ups and governments. These LEAP coalition partners share physical proximity, an international focus and the scale required to have impact. LEAP aims to **contribute positively to a green, smart society** that collectively embraces growth, the environment, people and society while respecting energy efficiency and preserving critical materials.

It is not a coincidence that LEAP was founded in the Netherlands. The Netherlands is the sustainable digital delta for frontrunners who invest in energy-efficient technology, distributed networks, 5G, photonics, edge computing and more circular and modular equipment. **LEAP wants to maintain the Netherlands' leading edge on innovation for future-proof digital infrastructure.** Our mission is to continue cultivating niches in which innovations can grow into **serious business alternatives** for the sector.

Why now?

The on-going digitisation of our society — which is accelerated by COVID-19 — means that more and more data is being generated, transmitted and stored, also at your organisation. Networks and data centres facilitate data traffic and IT equipment storage, while IT servers and software often remain the property of clients. An excellent digital infrastructure therefore is a precondition for society to run smoothly.

“The future is digital; future-proof digital infrastructures are essential.”

In 2030, we expect our current energy consumption to double. The sharp increase of data usage will ultimately up the demand for electrical energy. The electrification of transportation, heating and industry processing is another reason the Netherlands’ need for electricity is growing and leading to infrastructural investments and trade-offs.

Across the Amsterdam Metropolitan Area and the Netherlands, we feel a sense of urgency. We want technological breakthroughs to keep capitalising on the economic and social opportunities brought by digitisation. To envision and enact sustainable digital infrastructures for the future, we urgently need new public-private partnerships in the data centre sector. We seek organisations that can work collectively on future-proof systems and new initiatives. We acknowledge that one party alone cannot affect change around all of these issues. This is why it is important to work together.

This is how LEAP works

LEAP is uniquely positioned to generate an ecosystem where members inspire each other, share knowledge and collaborate on impactful innovations. Our **design phase** (finalising in 2021) will focus **on investigating and scoping promising concepts and developments** through a combination of research and co-creation along the different LEAP tracks. To stimulate the ecosystem, we will ramp up communication and knowledge-sharing. Through LEAP meetups, for example, we connect knowledge institutions, start-ups, businesses and governments.

At the same time, to develop the most promising technology we are seeking funding from, for example, the Knowledge and Innovation Agendas (KIAs) or national and European policies prioritising digitisation and energy.

Connect with Marjolein Bot, Lead Energy of the Amsterdam Economic Board, to join.

LEAP aims to tackle challenges in four areas:

The digital economy

- Data centres are the backbone of the digital economy, and 72% of colocation data centres are located in the Amsterdam Metropolitan Area (AMA). The Amsterdam Internet Exchange (AMS-IX) contributes to the region’s appeal as a global key connectivity hub attracting innovative technology companies.
- The Netherlands and the AMA want to uphold their position in being a leading innovative digital hub.

Technology & circularity

- Energy efficiency and sustainable technology developments must keep pace with market growth. The potential for ever smaller, faster and more energy-efficient electronics is showing its limits and new breakthroughs are needed.
- To reduce carbon emissions in the coming years, greater development and innovative application are essential. Technological innovation is necessary with energy efficiency and circular use of critical materials as conditions for future data growth.

A distributed smart system

- The current answer to data growth is consolidation and development of large, centrally located data centres needing vast amounts of energy. Soon, more closed loop control applications will exist via communication networks on the edge of this central system.
- A more distributed, decentralised smart system is needed, wherein the capacity for data is better attuned to energy availability and open to different types of integration within the physical environment.

Landscape

- The growth of digital infrastructures and data centres demands more and more space in terms of square metres. This implies that the issues centre not only on energy, but also spatial planning and specifically impacts on local residents.

“LEAP acts as a point of intersection between digitalisation, energy and use of space.”

LEAP 2025 goals

To enable new breakthroughs, we must apply and further develop technology as well as promote the circular use of ICT hardware. At the same time, we must boost innovative ways of interfacing between energy and digitisation. In 2025 LEAP has:

- **Created more/new/better opportunities** for a sustainable digital economy.
- Become a **recognised platform** for collaboration, knowledge-sharing and communication that yields solutions for the sustainability of digital infrastructure.
- **Ensured CO2 neutrality** by purchasing managers and business decision-makers taking care of critical materials used in their ICT products and services.
- Embedded its results in **regulatory, policy and standardisation** frames.
- Positively impacted **public debates** on digital infrastructures, energy and the environment.
- **Inspired a future generation** of data sector leaders and workers who are well-informed about innovation and sustainability.

“Through collaboration we are able to envision the future from different perspectives, and accelerate new developments.”

LEAP paths and first deliverables

Technology

LEAP Technology: Highly energy-efficient future technologies are poised to meet the exponential growth in data traffic. LEAP partners and renowned knowledge institutions, such as VU Amsterdam and PhotonDelta, are working on roadmaps that guide investments and inspire short-, medium- and long-term development projects.

First deliverable: We will present an innovation roadmap of technological developments that set the direction for investments.

Distributed

LEAP Distributed: By developing energy awareness in the architecture of hardware, data and software, both in energy usage and in energy flows, we can at the same time optimise energy costs and the availability of energy infrastructure. Distributed solutions also create new options in integration of digital infrastructure landscape. LEAP partners TNO ESI and Alliander are exploring what is needed and who can provide it.

First deliverable: We will conduct a stakeholder analysis of relevant actors and a first exploration of distributed hardware, data and software architecture.

Circular

LEAP Circular: Innovative procurement can play a role in promoting sustainable ICT hardware, which is worth investigation. LEAP partners are creating a movement that promotes the circular use of both energy and critical material use.

First deliverable: We will share insights into circular innovation, best-in-class technologies, initiatives, concepts and frontrunner companies.

Timeline 2021

Q4 2020: LEAP Meetup and launch Innovation Track

Winter 2020-2021: Research and co-creation

Spring 2021: First results of research & roadmap

Spring 2021: First application for (research) fund

Summer 2021: Assessment of most promising developments

Summer 2021: Further research proof of principle

Autumn/winter 2021: Development first pilots/demonstrations

LEAP learning community and eco-system