Securing the Grid: The Importance of DSO and City Cooperation

Brussels, 5 August 2024

1. The growing need for DSO-city cooperation

The energy transition is reshaping our power system. One of the main challenges for electric grids is accommodating the shift from centralised production to local generation. In this new scenario, about 80% of future renewable generation and electricity storage will be connected to distribution networks. This, coupled with the emergence of active consumers and rising electricity demand, is putting unprecedented stress on local distribution grids. With more than 75% of the EU population living in cities, urban areas represent the largest energy consumers and will be especially affected by local grid constraints. In some urban areas, delayed grid connections, congestion issues and limitations to infrastructure expansion are already limiting residential and commercial activities. If no timely and proactive measures are taken, these issues will become widespread across Europe, affecting not only city services but also EU businesses' competitiveness and ultimately hampering the energy transition.

> **To prevent further disruption of city activities, cooperation between DSOs and local authorities is essential to ensure that the status and needs of the grid are considered in urban planning and local decision-making.**

While this cooperation is encouraged by multiple EU initiatives, the lack of effective coordination mechanisms still stands as an obstacle to its effective implementation.

2. Challenges in DSO-city cooperation

Traditionally, DSOs and local authorities have been operating under different policies and regulations, often resulting in misaligned priorities. Municipal governments may focus on fostering urban growth, while DSOs prioritise maintaining the security of supply. Moreover, DSOs have historically had to react upon unplanned requests from municipalities to support urban developments and meet the municipalities' electric needs. However, in the transition to a clean energy system, this reactive approach can lead to inefficiencies and an increased risk of disruptions in city activities. Consider scenarios such as where a municipality decides to enhance the deployment of EV charging infrastructure, promote industrial development or integrate RES in a specific location. If the local grid is congested or approaching its capacity limits, achieving these objectives will not be feasible without reinforcing the grid or implementing flexibility solutions.

However, grid reinforcement entails significant costs and long waiting periods while flexibility solutions require careful coordination. ***Therefore, local decision-making cannot overlook the status of the grid because its capacity and stability dictates the feasibility of these decisions.*** To address these challenges, proactive and integrated planning is essential. By ensuring that the status and needs of the grid are considered in urban planning, both DSOs and local authorities can align their priorities, leading to more resilient grid and a well-coordinated urban growth. Effective communication is the cornerstone of a successful collaboration. However, practice shows that effective communication between DSOs and cities is hindered by:

1. The multitude of stakeholders that need to be involved – normally coming from different departments with their own interests and priorities;
2. The complexity of understanding technical grid issues for external stakeholders; and
3. The existence of practices that limit information sharing.

To address this multifaceted challenge, the project COPPER is developing the concept of Local Energy Action Plans (LEAPs) as enablers of seamless DSO-city collaboration.

LEAPs aim to streamline communication, reduce the knowledge gap and foster a culture of transparency and open communication for consistent information sharing.

3. Filling the gaps: delivering a platform for DSO-city collaboration

A LEAP is an action plan jointly developed by the municipal authorities and the DSO managing the local grid in consultation with other relevant stakeholders. LEAPs combine urban planning with energy network planning to ensure that planned actions consider the capabilities of the grid. Currently, DSOs have to maintain communication channels with many stakeholders in parallel, often coming from multiple departments including climate, energy, mobility, environment and/or housing. To overcome this hurdle, **LEAPs provide a single joint reference plan, streamlining communication and collaboration.** By bringing together different departments and stakeholders under a unified plan, LEAPs help reconcile diverse interests and promote coordinated action.

The goal is to provide a unique strategy for DSOs and cities to optimise existing grid infrastructure, avoiding congestion issues and costly investments while improving services and living conditions in the city. This collaboration provides a unique opportunity to coordinate investments in the low voltage network and meet city-wide priorities for the energy transition providing certainty and transparency over planning activities for both local authorities and DSOs. For this, LEAPs gather and present evidence-based information on the current state of urban infrastructure and development trends. The inclusion of information on the current conditions of the energy system (e.g. generation

sources, distribution network capacity, demand patterns) highlights the key aspects that need to be addressed to meet the long-term **strategic ambitions** for the area.

	The Dutch DSO Stedin and the local authorities in the city of Dordrecht are working on the joint development of a city LEAP. The city's strategic ambition for the area is the development of **Europe's first energy-neutral business park.**
	In the city of Ghent, the Belgian DSO Fluvius is collaborating closely with the local authorities to develop the city strategic ambition of developing and implementing an **all-electric neighbourhood** in Mariakerke.

LEAPs are designed to simplify and clarify technical grid issues for non-expert stakeholders, facilitating the translation complex technical jargon into understandable concepts. This approach ensures that all participants, regardless of their technical background, have a clear understanding of the grid's requirements and limitations. By aligning with the specific jargon used by the different stakeholders involved, LEAPS enhance comprehension and the alignment between urban and energy infrastructure plans, effectively bridging interdisciplinary knowledge gaps.

The scale of a LEAP is jointly defined by the local authority and the DSO, considering different pathways (e.g. EV charging pathways for a mobility LEAP in a specific neighbourhood). Given the localised nature of energy system challenges, a LEAP provides flexibility to adjust the scope of actions to a specific area (e.g. neighbourhood) or a priority sector (e.g. mobility). This process **enables the identification of existing practices that could hinder information sharing and cooperation among the different stakeholders** and it also allows for the joint exploration of solutions to overcome these obstacles. These solutions may include data-sharing agreements and regular updates that ensure timely and accurate information flow between DSOs and local authorities. By breaking down information silos, LEAPs ensure that all parties have access to the critical data needed for informed decision-making.

4. EU wide replication and future prospects

The content of a city LEAP will be dependent on the local priorities and capacity to deliver identified actions. However, the LEAP framework developed by COPPER will be designed to remain consistent across different contexts so it can be replicated across the EU. The ultimate goal is to ensure that actions are not duplicated, and that maximum benefits can be provided across sectors. In fact, LEAPs foster the establishment of an integrated planning framework based on building committees and task forces who jointly decide on those projects where urban and energy planning intersect, including:

1. The implementation of smart city technologies;
2. Resilience planning; and
3. Funding models.

Within the LEAP framework developed in COPPER, six pilot cities are developing city LEAPs to achieve their strategic ambitions, taking into account their specific environments. These LEAPs encompass a wide range of strategic priorities that require integrated planning to ensure the status and needs of the grid are incorporated into urban development processes. By tailoring LEAPs to the unique conditions and goals of each city, these pilots aim to demonstrate a coordinated approach to urban planning and grid management, fostering sustainable and resilient urban growth.

	The local DSO in Varberg will pilot a city-wide virtual power plant to facilitate the connection of private customers' assets to the local grid, while earning an income from providing flexibility services.
	The city of Bremen aims to strategically develop the city's charging infrastructure for Cambio's electric vehicles, in collaboration with the local DSO Wesernetz.
	In Fredericia, the development of a visualisation tool to map power flows around the city, will give the municipality a strong understanding of their local energy system to support any further urban planning decisions.
	Working closely with local DSO Fluvius, the city of Antwerp will pilot solutions for the e-mobility and district heating infrastructure, which are two significant strains on its increasingly decentralised grid.

If you are interested in learning more about LEAPs you can find all the information pilots' details here. ***Do you want to contribute to the development of LEAPs?*** Your input as a DSO is crucial in shaping effective collaboration strategies with local governments.

Please take a minute to share your experience with this **short survey** and help us drive positive change.