ACCELERATING RENEWABLE ENERGY INVESTMENT IN THE EUROPE AND EURASIA REGION

A WORLDWIDE REVIEW OF BEST PRACTICES IN QUEUE MANAGEMENT – Executive Summary

SUBAGREEMENT NO. USEA/USAID - 7200AA22CA00028

December 20, 2023

This report made possible by the support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the United States Energy Association and do not necessarily reflect the views of USAID or the United States Government.

JUST AND SECURE ENERGY TRANSITION PROGRAM

ACCELERATING RENEWABLE ENERGY INVESTMENT IN THE EUROPE AND EURASIA REGION

A WORLDWIDE REVIEW OF BEST PRACTICES IN QUEUE MANAGEMENT

Prepared for:

United States Agency for International Development

By the United States Energy Association
SUBAGREEMENT NO. USEA/USAID - 7200AA22CA00028

Authors: Elia Grid International

United States Energy Association
1300 Pennsylvania Avenue, NW
Suite 550, Mailbox 142
Washington, DC 20004
+1 202 312-1230 (USA)

This report is made possible by the support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of the United States Energy Association and do not necessarily reflect the views of USAID or the United States Government.

1. Executive Summary

Electricity network operators, regulators and policy-makers worldwide face a common challenge. The cost of wind and solar energy has dropped dramatically, and financial incentives in many countries and states have caused transmission system operators (TSOs) to receive far more applications to connect to the grid than they can accommodate. In this context, how can TSOs best rank order and decide which projects to connect, particularly from clean energy sources?

While a significant share of the candidate projects may not come to fruition, many countries have inadequate means to determine which projects are positioned to succeed, and to prioritize them for connection. The resulting backlog has two negative impacts: 1) it creates a bottleneck that prevents countries from reaching their renewable goals, or encourages them to pick "favorite" projects; and 2) it prevents the TSOs from properly planning their substations, system upgrades and investments, since they cannot rely on certain projects to come to fruition, or to do so at the expected time. This uncertainty also complicates system balancing and can impede cross-border electricity trade.

In places such as the Western Balkans, it would take many years for the TSOs to work through the applications received based on the date of their application. This "first come, first served" approach became common when there were few applications, and it should now change. The best practice for queue management (QM) worldwide today is a "first-ready, first-served" approach, and countries regionwide and beyond will benefit from accelerating their move to such a process.

In this context, the Just and Secure Energy Transition (JSET) initiative of the U.S. Energy Association (USEA), in partnership with the U.S. Agency for International Development (USAID), commissioned this study to identify the best QM practices in a number of jurisdictions worldwide, and to extract the lessons learned. JSET will work with key stakeholders in the Europe & Eurasia region to determine how to effectively modify their technical, regulatory and legal practices to resolve the QM challenges. JSET is actively engaged in Serbia at present, and plans to expand this effort to other locations soon.

A number of countries and regions have made substantial progress in addressing the QM question, and this report captures the lessons from such experience. For this report, JSET evaluated seven places – four US regions (SPP, PJM, MISO and NYISO), one Canadian province (Ontario), and two European countries (Germany and Belgium) – to extract this information.

Worldwide, there is no "one size fits all" approach. However, there are key principles that emerge from all seven places that JSET recommends that others consider as they seek to improve their queue process, and accelerate the integration of renewable energy systems (RES) and clean energy more broadly. Those QM principles fall into three categories:

- Managing the QM process;
- Ensuring project and TSO readiness; and
- Discouraging speculative projects while clearing the queue.

A summary of this Report's findings in these three areas follows.

At the outset, though, those seeking to prioritize projects for grid connection need to make policy decisions, and one of the most important decisions is the type(s) of costs to impose on applicants.

The heart of this issue is whether to allocate "shallow" or "deep" costs on developers to connect to the network. Shallow costs refer to the developer paying only their share of cost to connect at the substation or point of interconnection (POI), while deep costs require the developer to also pay their share of costs to upgrade the grid to which they are connecting. Allocating such costs is more complex under the deep approach, since the TSO must separate normal, planned upgrades from site and project-related costs.

In general, Europe uses a shallow approach, especially on the transmission system, and a few countries use a combination, as shown below, while the US generally uses a deep approach.

		AT	BE	BG	HR	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	NO	PL	PT	RO	SK	SI	ES	SE
Transmission	Shallow	●	●	●		●	●	●		●	●	●	●		●	●			●		●		●		●	●	●		
	Deep				●				●					●			●	●					●		●	●		●	●	●
Distribution	Shallow	●		●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●	●	●		
	Deep		●		●			●	●	●		●	●	●			●	●		●		●		●	●	●		●	●

Having made this decision, policy makers, regulators and TSOs can apply the practices that have proven most effective across time and countries for generator connection, recognizing that QM is a work in progress. Even those with extensive experience continue to improve their QM procedures.

The bulleted lists below are not stand-alone recommendations. Rather, authorities must stitch them into an integrated whole, from the start of the application process, through the date when successful projects come on line, and so they can operate effectively for decades to come. That is, the goal of QM is not only to connect the most prepared projects. QM and other procedures must also integrate such projects into a cleaner, more reliable and cost-effective power system that meets customers' needs over the long term. QM, while challenging, is just one (albeit vital) element of the massive transition underway in electricity planning, operations, markets and environmental responsibility.

1. Setting up and Managing the QM process

- Set Financial Standards.
  - Require a meaningful fee to join the queue, to pay for the connection studies.
  - Institute substantial, increasing payments or performance bonds to proceed to successive rounds of the connection analysis.
  - Require forfeiture if projects fail to meet milestones, and increase payments to remain in the queue after each round of connection studies.
- Cluster the Applications.
  - Set open time windows for new project applications.
  - If there are more MW of applications than the TSO can accommodate, group them for connection studies to determine the collective upgrades required.
  - Allocate upgrade costs to each project in the group, and allow developers to drop out once they learn their allocated cost.

- Re-Cluster and Repeat. Conduct several rounds of connection analysis (three is best practice) to narrow the field and set the final cost for each project to connect.
- Recognize Small vs. Large Projects. Consider a separate approach with fewer or more flexible requirements for small projects with less impact on the grid.
- Anticipate Proactive Involvement of Policy Makers and Regulators. These organizations have a vital role in establishing the QM framework and overseeing effective QM implementation.
- Communicate, Collaborate, Set Expectations and Share Resources in a Transparent Way.
    - Keep aligned with legislation, regulators and policy makers. Seek input and propose options when regulations, laws or policies are unclear.
    - Develop and maintain a website detailing the grid code requirements for connection; the requirements and milestones for advancing in the queue. Regularly update the position of each proposed project in the queue online.
    - Allow individual pre-application meetings, especially with developers that have mature projects, to help anticipate and target the applications to connect.
    - Hold structured meetings during the QM process to gain and share information.
    - Consider organizing an open stakeholder process with committees to provide feedback to the TSO before and during the connection process.
    - Provide examples of proforma agreements developers will need to sign before their projects connect to the grid. This may include a connection agreement, a construction agreement, and an operating agreement. If there are impacts on neighboring systems, this may require an agreement with the neighbor(s).
    - Develop an on-line tool to enable applicants to conduct a preliminary point-of-interconnection study to facilitate better connection requests.
- Keep the Process Moving.
    - Set timelines for the TSO to conduct connection studies and review project applications for milestone compliance.
    - Set target times for government, local agencies and ministries to review application permits and siting applications.
    - Once the TSO determines the required upgrades, build them in a timely manner to align with the agreements signed for when the projects expect to come on line
- Allow Project Modifications. Permit applicants to modify connection requests (e.g., change the MW size and equipment) at the initial stages, and greatly reduce flexibility late in the process.

2. Ensuring Project and TSO Readiness

- Regularly Raise the Bar. To ensure developers are prepared, establish increasingly strict requirements and transparent milestones for projects to advance. These could include:
    - Demonstrating land ownership or control for an extended period
    - Signing required contracts (e.g., connection, operational) with the TSO
    - Determining which permits and licenses to require at each stage of the application, and requiring that applicants show they have filed for and obtained them.
    - Making required security deposits or showing support from financial institutions
    - Contracting for key equipment (e.g., panels, turbines), especially late in the process
- Identify the Best Grid Locations.
    - Direct developers to the best places to connect, with existing hosting capacity.
    - Allow connection before upgrading the grid to handle congestion through "active grid management" in which developers assume some risk of project cutoffs.
    - Identify locations where connection is not viable or highly discouraged.

- Coordinate QM With Grid Planning. Adding substantial clean energy will require system upgrades. Link QM with grid and reliability planning, domestically and across borders.
- Anticipate Staffing and Analytic Needs.
    - The TSO should expect to spend substantial time evaluating bids.
    - They should hire sufficient staff and consultants to conduct needed engineering, modeling, planning, legal and communications parts of the QM effort.
    - More complex projects may require an Electro-Magnetic Transients (EMT) study, and a Sub-Synchronous Resonance (SSR) evaluation.

3. Discouraging Speculative Projects, and Clearing the Queue

- Enforce the Readiness Standards.
    - Give project developers notice of non-compliance at each stage of the application process and provide a limited period for them to "cure" the deficiency.
    - If they cannot alleviate the problem, retain their payments to date, and require them to resubmit their application in another round for later consideration.
    - Use such funds for connection studies later in the process and for system upgrades.
- Consider a Fast-Track Process. This applies to projects that can demonstrate they are nearly ready to connect, and where there is hosting capacity available.
- Replace the Old Process with the New.
    - Ensure that regulations and the law allow the new approach.
    - Plan internally for the transition from the existing backlog to the new approach.
    - Determine whether those now in the queue must resubmit under the new process.
- Reduce or Phase Out RES Incentives. This will help narrow the applicants to those who are serious developers and winnow out financial players seeking above-market payments.

This Report examines QM and generation connection practices worldwide, identifying the lessons learned, so that others may benefit from this experience. Decarbonization policies, financial and access incentives, technology cost reductions, increasing market integration, and power system transformation have led to rising demands to connect, especially from clean energy projects. To manage the rising queues, while encouraging such types of generation, it is important to consider how to best reform the connection process, as part of an ongoing grid management and investment program.

It is important for QM to strike a balance between advancing policy goals and ensuring grid stability and reliability. By sending clear and transparent signals to those applying to connect, TSOs can avoid balancing and stability concerns while effectively integrating clean energy and managing the queue.

There is a significant opportunity in the next few years to accelerate renewables by improving the QM and grid planning processes in Europe & Eurasia. JSET has designed this Report to support that effort.