

OPENGRID PLATFORM COMPONENTS – TRANSLATOR

One open platform, powerful interoperable components

OpenGrid's foundation is robust, trusted, open data, with task-ready applications layered on top. Each component was shaped by conversations with the grid planning community and user research on modeling pain points, and each deep-dive sets out what we heard, the outcome we're working toward, and a draft product concept for the community to react to.

Each deep-dive draws on more than 65 conversations with over 55 participants globally across the grid planning ecosystem, conducted in early 2026. We group participants into six personas along two lines: whether they produce analyses or use them, and whether they sit inside or outside the organization whose decisions are at stake. Each group brings different needs, and together they shape how every OpenGrid component is designed. To protect confidentiality, interviewees are identified only by organization type. The draft product concepts are starting points for OpenGrid's Technical Committee and working groups to refine, and we expect scope, priorities, and naming to change as that work happens.

This summary describes the current vision for each component of the OpenGrid Platform. They are not definitive specifications and are still subject to ongoing refinement. Each component will be shaped by the Technical Committee and a working group that is open to anyone who wants to take part. We expect scope, priorities and naming to change as that work happens. Comments, corrections and alternative proposals are welcome. We are publishing at this stage deliberately, so that direction can be shaped in the open rather than presented once it is already fixed.

Translator

Pain points, from user research

A single study can force a modeler through three or four tools, re-entering the same data by hand at each boundary, and switching tools means rebuilding every pipeline. Interviewees in every group raised it, and it drew the single strongest endorsement in the research.

What we heard

- A US RTO ranked Translator first among all OpenGrid products: "Achievable with clear short and long-term benefits." Its most critical translations are between PLEXOS and PROMOD (production cost), PSS/E and TARA (power flow), and dynamics and dynamic security assessment tools. It said translation would reduce vendor lock-in by increasing competition.
- A European TSO described data handovers between tools as "extinguishing fires when they appear," easily a few hours per single-year analysis, with mapping tables that become inaccurate over time.
- The same TSO switched to a new commercial tool and had to rebuild all ingestion and scripting from scratch. Learning the tool was easy; the pain was switching cost, which now makes it deeply reluctant to switch again.
- A US IOU manually replicates models across software, taking screenshots from one model to recreate it in another. It built its own converter from a legacy distribution planning tool to OpenDSS, but it was imperfect because the legacy tool lacks geocoordinates.
- Another US IOU moves each study from an application portal through power flow, reliability, and EMT tools, with data prep taking "days to weeks per cluster."
- An Asia Pacific DSO: "In my ideal state, we maintain one model and it translates into separate models when needed." Its priorities are PSCAD, PSS/E, PowerFactory, and OpenDSS, with a caveat: "how well it translates into the same results is where my head goes."
- An independent consultancy named model basis risk as a major blocker: stakeholders worry when commercial and open-source models give different answers. Converters can reduce that risk by aligning inputs and enabling benchmarking.

What users asked for

- The Asia Pacific DSO wants one maintained model that translates into each tool when needed, with governance to ensure results are consistent across tools.
- A European TSO described a middle ground some TSOs favor, an "open optimization model approach": a shared mathematical formulation layer with translators between existing tools.
- A US university called a hub-and-spoke translator design with a canonical framework at the center "extremely valuable."

Vision

Moving a model between tools, or carrying results from one kind of study into the next, is fast, routine, and trustworthy.

A planner maintains one model and uses it in whichever tools a question calls for, open-source or commercial, without rebuilding it by hand or maintaining mapping tables that drift out of date. The results of a capacity expansion study flow into production cost and network analysis without weeks of rework. Choosing a tool becomes a decision about which one is best for the job.

Translation is only useful if it is trusted and observable. Every mapping can be inspected, and where something has no clean equivalent in the other tool, the gap is flagged for a person to resolve, with no hidden assumptions made on their behalf. What does translate produces answers comparable to the original, with any differences measured and explained, so results from different tools can stand side by side without anyone having to take them on faith.

Draft product concept (for discussion)

The Translator moves data (inputs and outputs) between the formats that grid modeling tools actually use. It covers two cases: moving a model between tools of the same type (one capacity expansion model to another), and carrying outputs from one study type into the next (capacity expansion into production cost into power flow). The aim is that switching between common tools, or chaining them in sequence, becomes routine.

It would be built around three design commitments:

- 1. Explicit gaps.** Where a translation is not possible, the Translator says so and describes the gap so a person can resolve it, and it never silently drops or approximates a field.
- 2. Measured consistency.** Each supported translation carries validation results comparing outputs across tools on shared test cases, so users can see where answers agree and where they diverge.
- 3. A contributor community.** Organizations with their own tools can connect them to others via the Translator, and translations are maintained as tools evolve and new ones appear.

Boundaries. The Translator converts formats and schemas between tools. Wrapping tools so they can be invoked is Model Plugins, and defining the canonical schemas everything resolves against is Open Standards & Schema.

Who We Heard From

Our platform components were shaped by more than 65 conversations with over 55 participants across the grid planning ecosystem. We group them into six personas along two lines: whether they produce analyses or use them, and whether they sit inside or outside the organization whose decisions are at stake.

Producer Side — People Who Run the Models

Transmission-System Users. Engineers and planners at ISOs, RTOs, TSOs and vertically integrated utilities who model the bulk system, often chaining three to five specialized tools through a single study.

Primary Distribution-System Users. Operators and modelers of distribution networks, from Europe's largest DSOs to small municipal utilities with one- to five-person teams.

Point-Source Modelers. Developers, hyperscaler procurement teams and community energy buyers who model a single point of grid interaction, with analyses that must be defensible enough to underwrite capital commitments.

Consumer Side — People Who Use the Results

Internal Decisionmakers. People who use model outputs to allocate their own organization's capital and must trust analysis they did not run.

External Evaluators. Regulators, intervenors, advocacy organizations, think tanks and data-infrastructure bodies who use outputs to scrutinize decisions made by better-resourced entities.

Straddling Both

External Primary Modelers. Analysts at public utility commissions, reliability councils, think tanks and capacity-building organizations who run their own models to examine decisions made by others.