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# Your best grid plan for tomorrow

Day-ahead planning for grid operators, and where enliteAI FLEX makes the difference

*Swipe →*

# Five levers to control a grid



## Voltage & reactive power

OLTC and rONT, capacitors, STATCOM, inverter Q(U)



## Power flow

Phase shifters, HVDC, FACTS, dynamic line rating



## Topology

Switch lines, split busbars, move MV open points



## Flexibility

Redispatch, storage, controllable loads, DOE, local flex markets



## Last resort

Reserves, load shedding, system protection

*Zero-cost levers first, costly ones last*



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# Day-ahead: formal for TSOs, emerging for DSOs

1. **12:00 D-1**
   Day-ahead market coupling sets generation and load schedules
2. **Afternoon D-1**
   Congestion forecast per TSO, merged into a Common Grid Model
3. **Evening D-1**
   Coordinated N-1 security analysis for all 96 quarter-hours
4. **Remedial actions**
   Preventive or curative, agreed across TSOs
5. **Intraday**
   Continuous update and correction

**DSOs:** far less formalised so far. PV, heat pumps, EVs, NOVA and the new flexibility network codes are changing that now.

# The operator's action space, 96 times a day

## Discrete

- Switch states and MV open points
- Tap positions (OLTC, rONT, PST)
- Reactors and capacitors

## Continuous

- Q and voltage setpoints
- Storage and HVDC P setpoints
- Flex, curtailment, DOE limits

**Constraints** Voltage band, loading < 100 % under N-1, switching limits, ramps, state of charge, contracts

**Objective** Minimum cost and violations, plus losses, asset wear and fair curtailment

**Mixed-integer · nonlinear (AC) · uncertain**

# A huge action space, and no time to use it

Without visibility into tomorrow's grid, operators react, and often with the bluntest tool:



## Curtailment

Lost renewable energy, unhappy customers



## Static connection limits

Conservative margins block new PV, heat pumps and EVs



## Reinforcement

Copper and years of lead time where code could do it today

# enliteAI FLEX covers the whole day-ahead loop



## 1 See

Where and when the grid gets tight tomorrow, with uncertainty



## 2 Understand

Why: voltage or current, PV or load, which feeder



## 3 Decide

The cheapest mix of all levers, zero-cost first



## 4 Secure

Ready-made actions if tomorrow turns out differently



## 5 Prove

Measured gain against a no-FLEX baseline

# From reacting to planning

| | Today | With FLEX |
|---|---|---|
| **Picture of D+1** | Little MV/LV measurement | **p.u. voltage and loading per node, P10–P90** |
| **Actions** | One measure, often curtailment | **Joint optimisation of all levers** |
| **Uncertainty** | Large safety margins | **Preventive plus curative playbook** |
| **Sign-off** | Manual, hard to trace | **Proposal with reasons, operator approves** |
| **Review** | Rarely | **Plan vs. actual, baseline vs. FLEX** |

# 10 ways FLEX helps beyond today's use cases

1. **Probabilistic forecasts** risk, not just a point value
2. **Merit order of actions** zero-cost levers first
3. **Time coupling** storage, tap budget, ramps over the day
4. **Right-sized flexibility** buy only what's needed
5. **DOEs from the plan** higher limits where taps help
6. **Outage planning** safe windows for maintenance
7. **Curative playbooks** if-then actions ready for intraday
8. **Active TSO interface** P/Q range at the boundary
9. **Asset care** tap wear and transformer ageing priced in
10. **Back to planning** recurring congestion as NOVA evidence

# The operator stays in charge, and the system learns



## Human in the loop

- Proposals with reasons: which node, which violation, why
- Variants and what-if, the operator approves
- Every decision logged (AI Act, NIS2)



## Learning loop

- Plan vs. actual, every day
- Better forecasts per node and weather situation
- Strategies trained in the digital twin (graph RL)

# Prove it, don't just claim it

Every action is measured against a no-FLEX baseline.



## ACER/CEER KPIs

with vs. without smart measures



## Hosting capacity

gained on existing assets



## Curtailment

avoided



## Investments

deferred where operation suffices

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# “What is my best plan for tomorrow, and am I covered if it turns out differently?”

Start in advisory mode, then setpoint control, then automation for clear cases.

***Less copper. More code.***

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