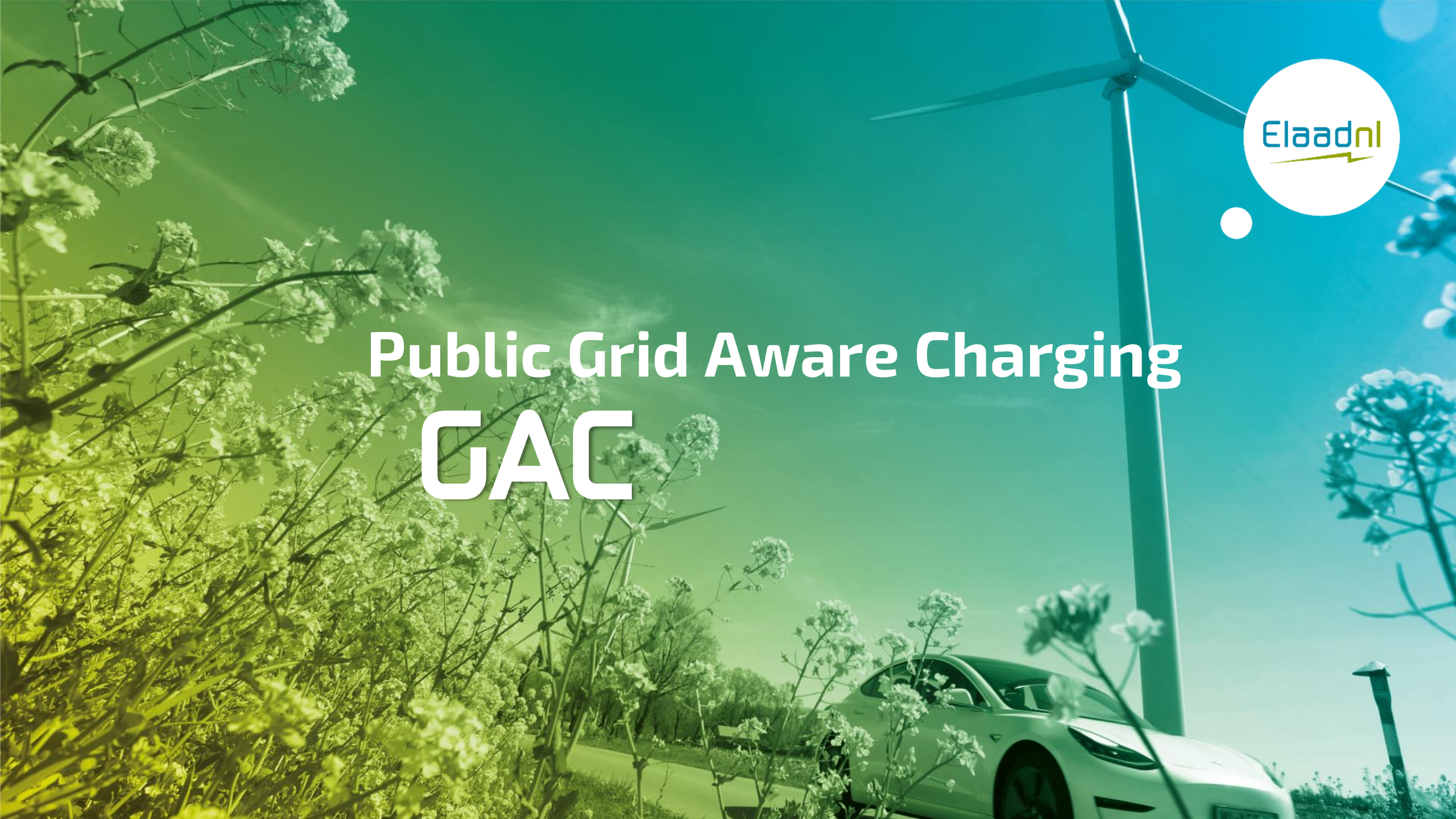
Dutch OpenADR initiatives

Agenda

01	Public Grid Aware Charging
02	NL Flex – Smart Devices
03	FlexMCS – Megawatt Charging
04	DITM – CCAM
05	OpenADR tools

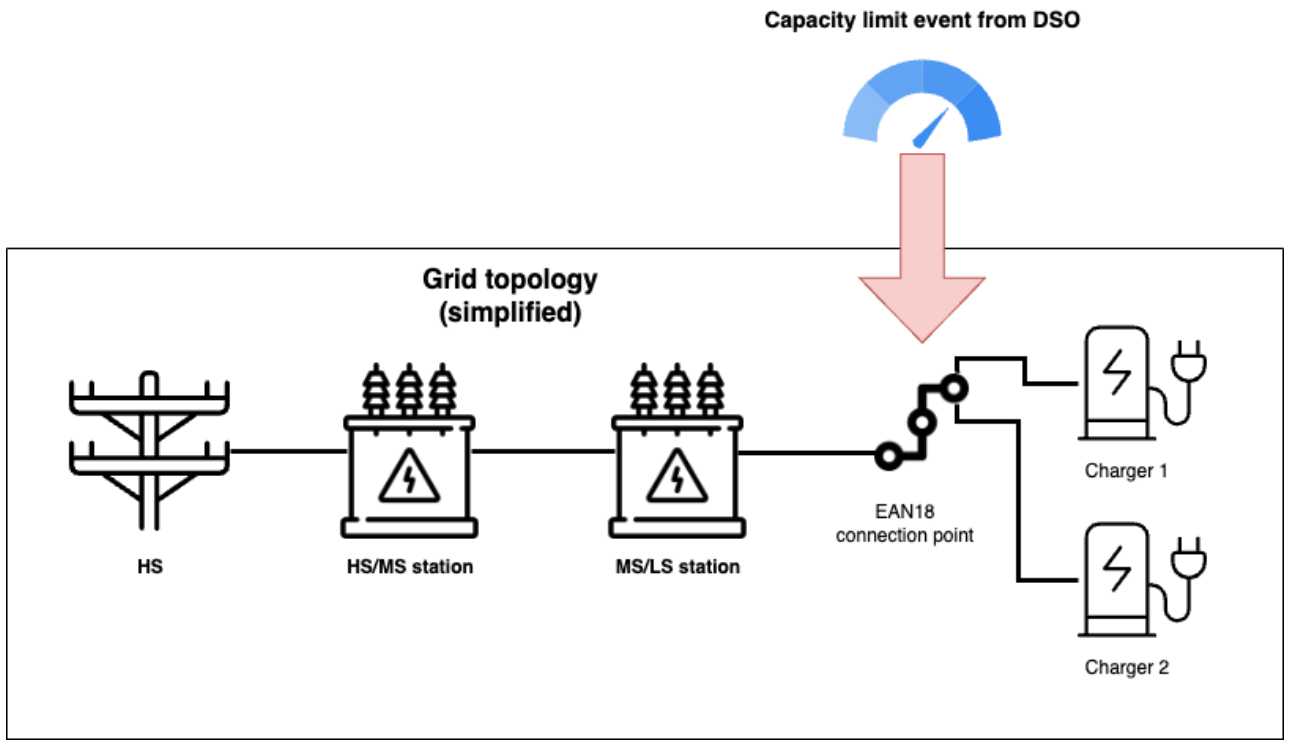
Public Grid Aware Charging

GAC



Current scope

- Public AC charging stations
- Focus on Dutch DSOs and CPOs (with international orientation)
- Simple DR signals: limit per cluster of PCCs



Implementation

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{
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                    "type": "VEN_NAME",
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    "payloadDescriptors":
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                {
                    "payloadType": "IMPORT_CAPACITY_LIMIT",
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            ],
    "intervals": [
                {
                    "id": 0,
                    "intervalPeriod":
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                            "start": "2025-01-15T16:00:00Z",
                            "duration": "PT1H"
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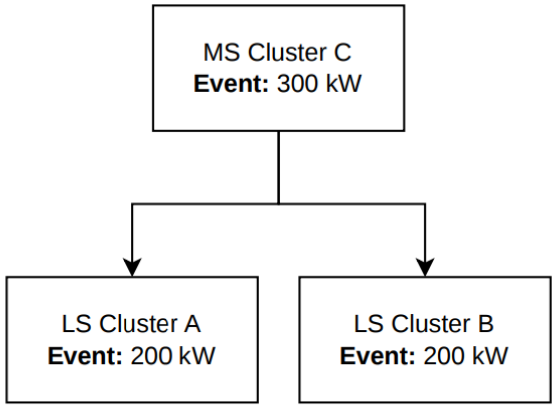
                            {
                                "type": "IMPORT_CAPACITY_LIMIT",
                                "values": [10]
                            }
                        ]
                }
            ]
}
```

Status

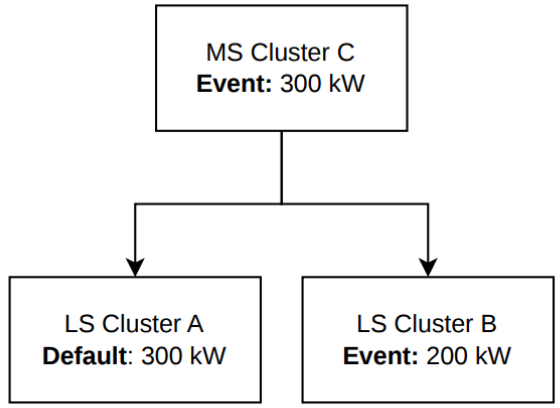
- GAC 2.0 has been released late 2025
  - Based on OpenADR 3.0
- Implementation status: partially operational
  - Several DSOs and CPOs have already implemented and are operational
  - Some use static profiles, others use dynamic profiles
- Future Plans: GAC 2.1
  - Upgrade to OpenADR 3.1
  - Focus: Hierarchical Clusters
  - Planned release: April 30th, 2026
  - Implementation deadline for VTN and VEN: October 1st, 2026

Future: Hierarchical Clusters



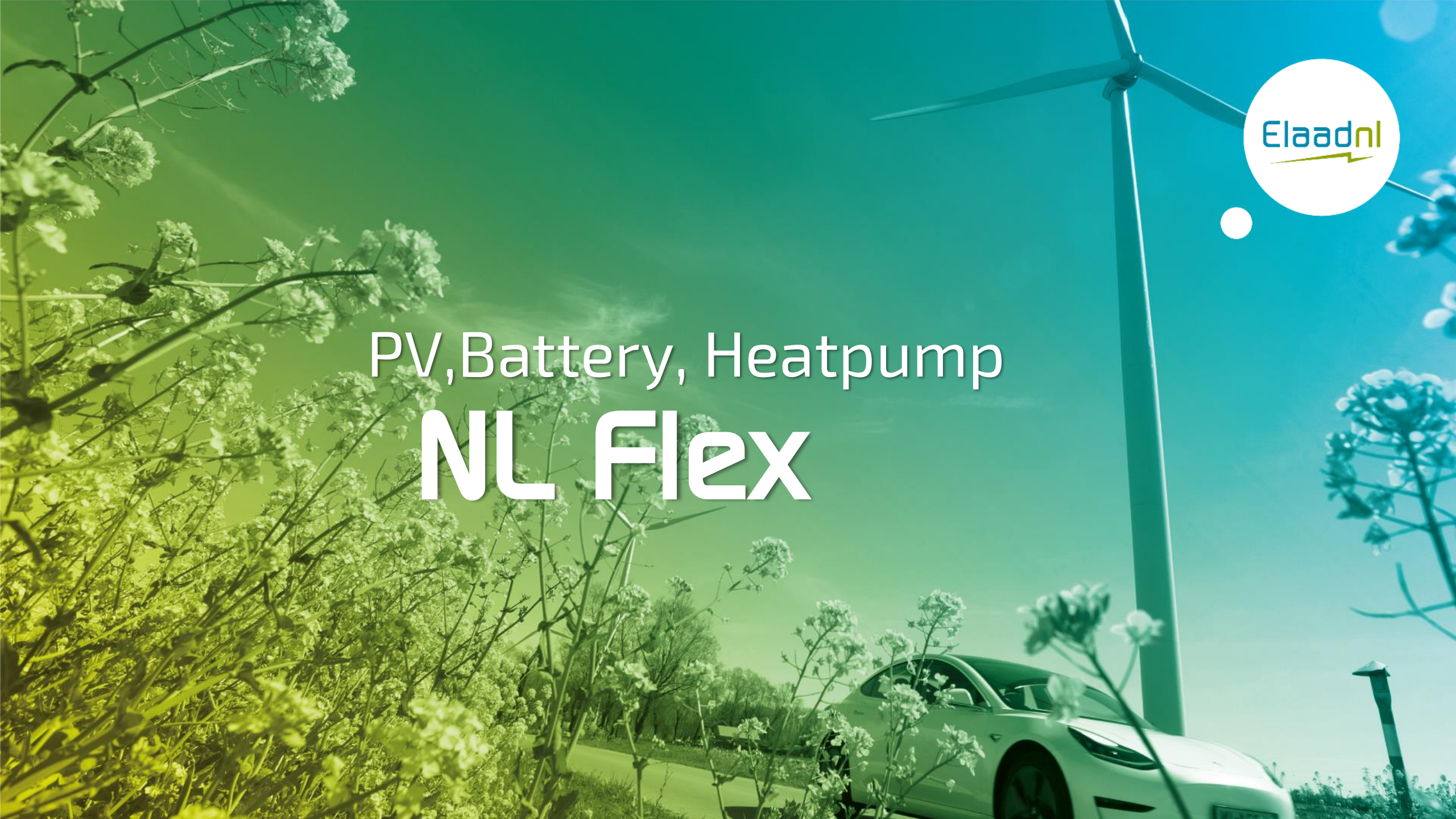
Aggregator decides distribution within LS, as long as limits are respected

LS Cluster A	LS Cluster B
150 kW	150 kW
200 kW	100 kW
50 kW	200 kW



Aggregator decides distribution within LS, as long as limits are respected

LS Cluster A	LS Cluster B
300 kW	*0 kW*
200 kW	100 kW
50 kW	200 kW


Elaadnl
PV,Battery, Heatpump
NL Flex

Intention

NL Flex – National collaboration between Dutch grid operators and energy suppliers to scale residential flexibility to relieve grid congestion.

Market-driven flexibility – Grid operators request flexibility, while suppliers and aggregators control consumer assets behind the meter.

Focus on household assets – Includes grid-aware home EV charging, home batteries, heat pumps, and other controllable devices.

From pilot to scalable solution – Goal is nationwide deployment of residential flexibility to support grid stability.

Current Pilots

PV/Solar	Battery	Heatpumps
• Generation curtailment • Intended live date: Summer 2026	• Generation and consumption curtailment • Generation and consumption requests • Intended live date: Winter 2026	• Consumption curtailment • Intended live date: Winter 2026

Role of OpenADR

Provide communication between DSOs and Aggregators

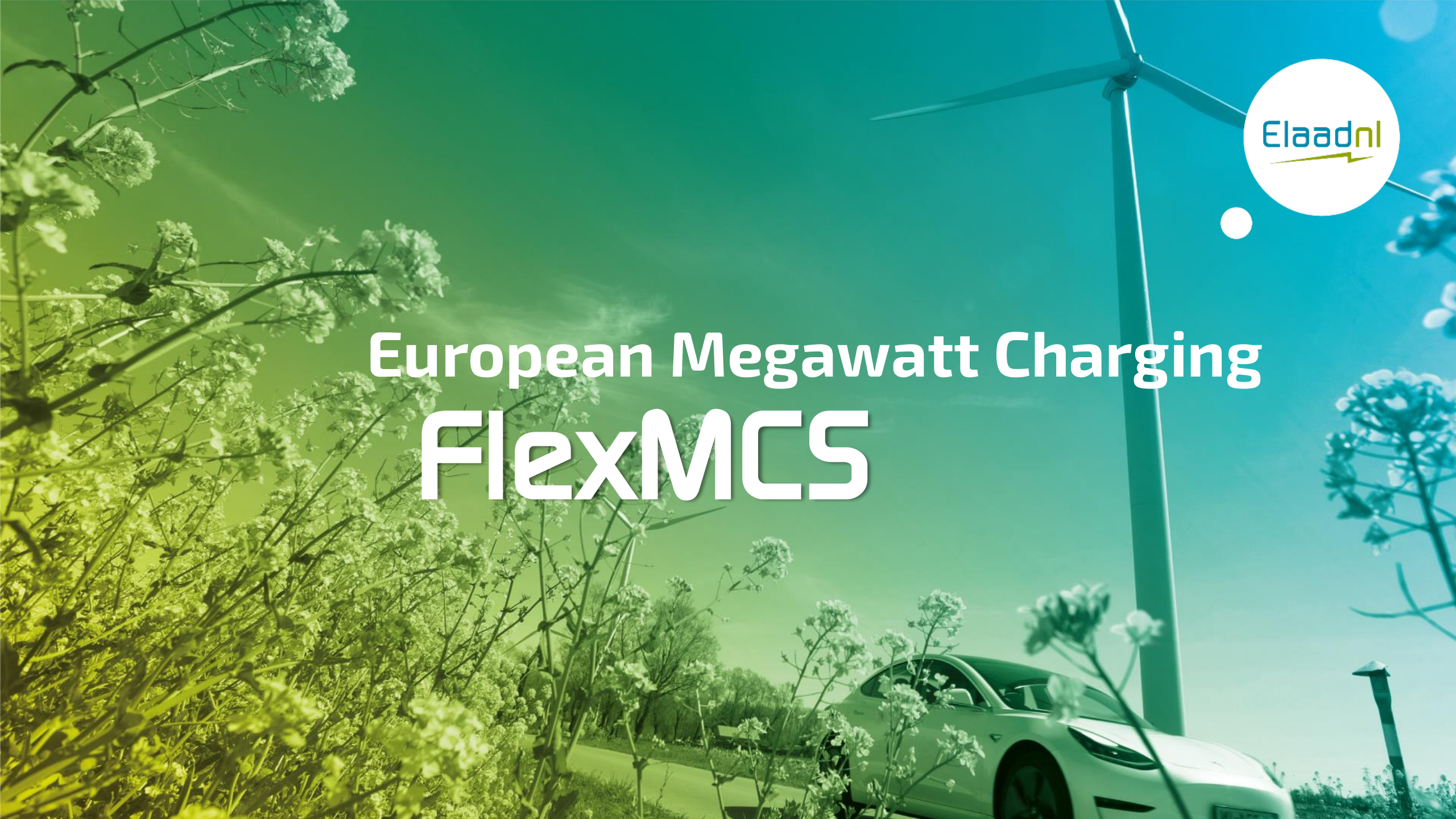
Allow flex requests based on grid domains, and allow Aggregrator distribution of flex requests

Provide a flex capacity reporting path from Aggregator to DSO

Provide validation of delivery from Aggregator to DSO

Example Signal

Not available yet, we're currently looking at implementation details.


Elaadnl
European Megawatt Charging
FlexMCS

Intention

Megawatt truck charging – FLEXMCS develops flexible high-power charging hubs for electric heavy-duty vehicles.

Grid-aware operation – Charging infrastructure must respond to grid constraints and congestion.

Site-aware operation – HDV charging will mostly happen at existing sites and should work with other on-site energy systems.

Interoperable control – Standardized signals allow scalable coordination between grid operators and charging infrastructure.

Large Demands, Big Guns

- Focus on the ~1 MW Class
- Up to around 3.75 MW per charger
- Concept Hub with 4 chargers

MCS plug

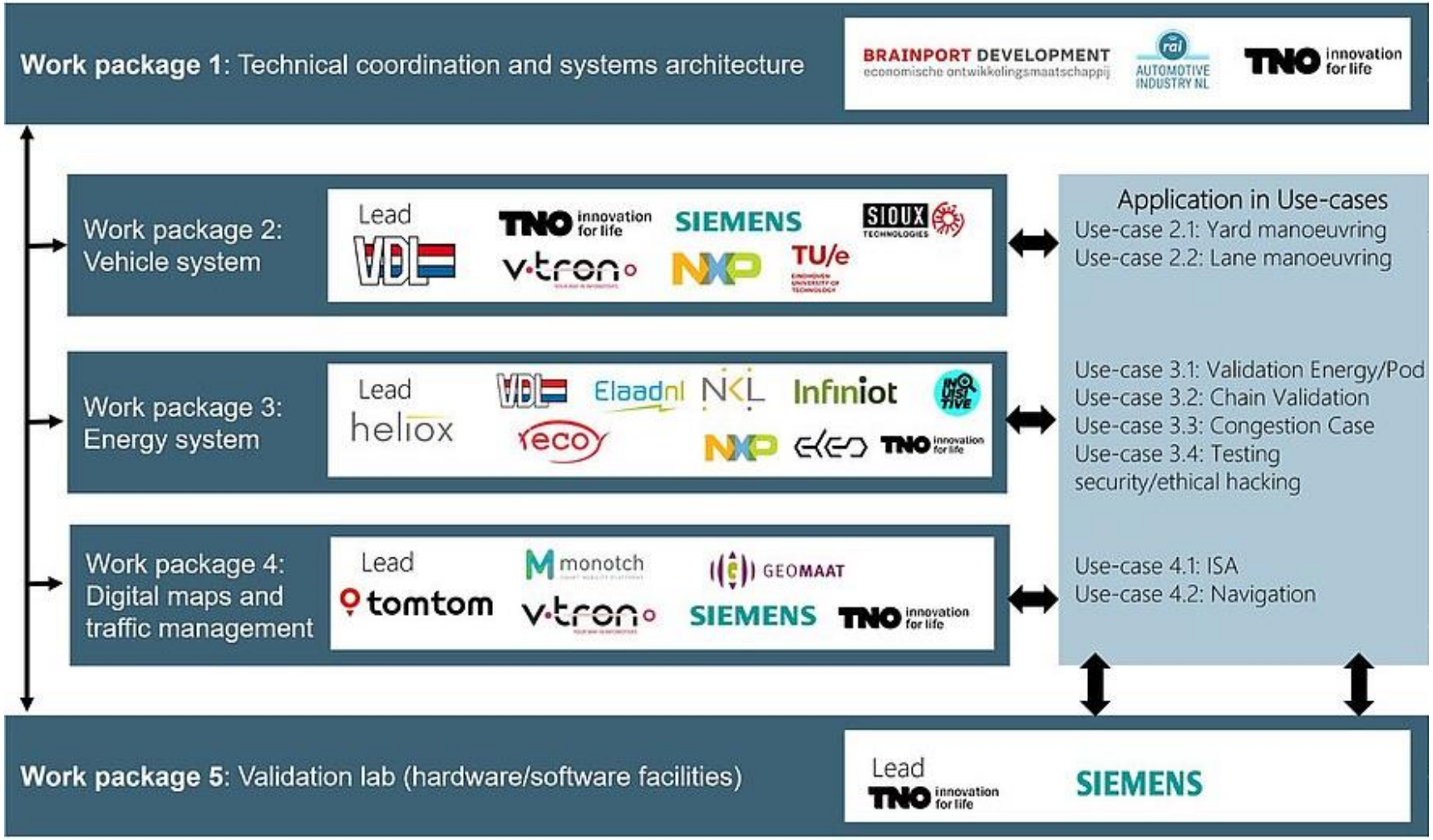
The role of OpenADR

- OpenADR 3
- Between Utility and hub/SEMS
- Day Ahead and intra-day being evaluated
- Import curtailment signal

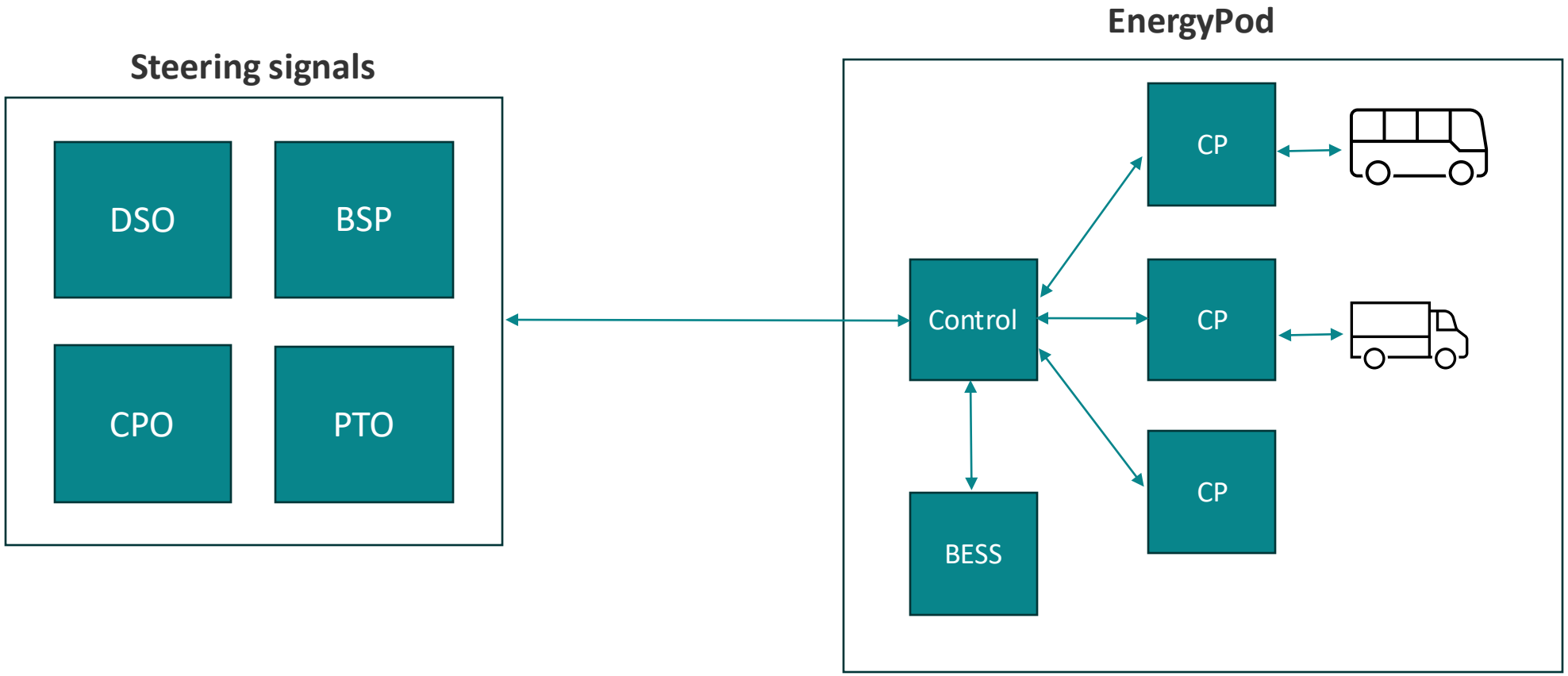
Cooperative, Connected and Automated Mobilitysystems

DITM

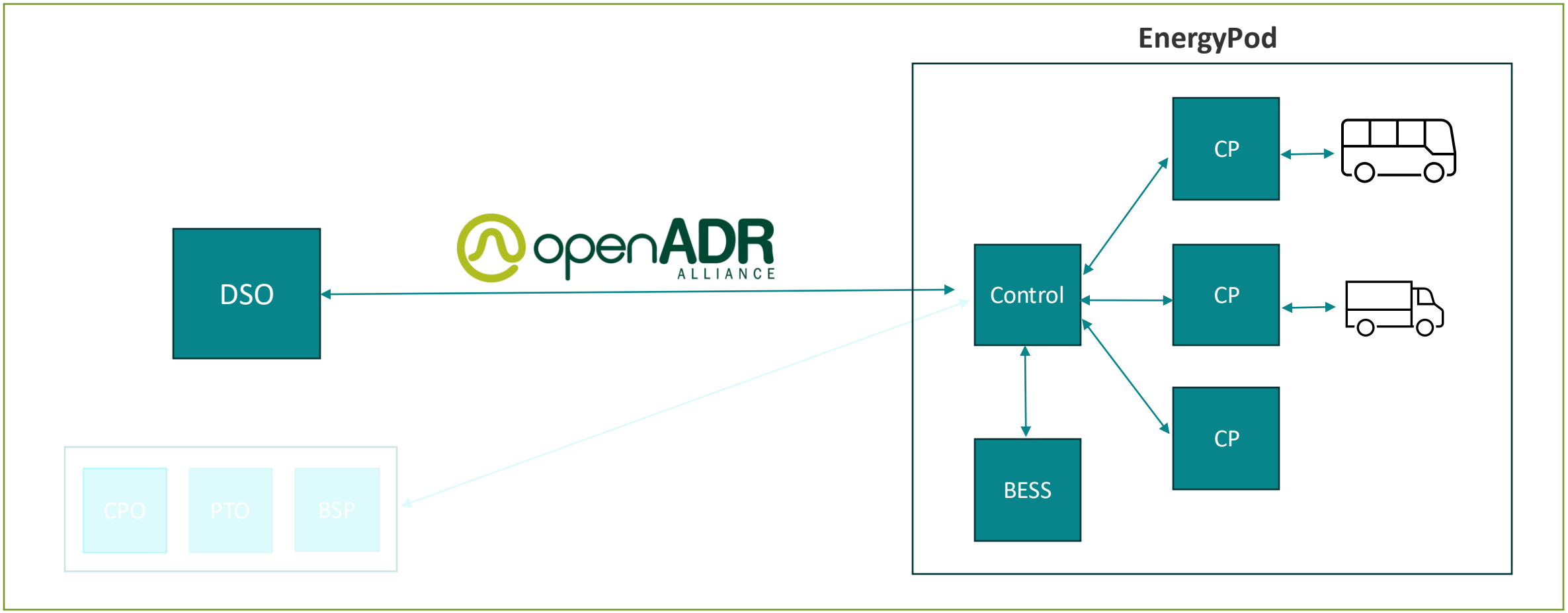
DITM overview



WP3 – Energy Systems



Energy System – Zoomed In



OpenADR signal

- OpenADR 3
- Day Ahead
- Import curtailment signal


Elaadnl
Facilitated by ElaadNL
OpenADR Tools

Open Source Tools

- OpenLEADR-rs
  - Open-source implementation of OpenADR VTN (server)
  - Developed by Tweede Golf with ElaadNL
  - 3.0 supported, ongoing development on 3.1.
- OpenADR3-client
  - Open-source Python SDK for the VEN (client)
  - Developed by ElaadNL
- OpenADR3-GUI
  - Open-source graphical user interface for the VTN (server)
  - Developed by ElaadNL

GAC test tool

- Program compliance testing
- Not a replacement for the Alliance test tool, but an addition
- Built on top of OpenLEADR