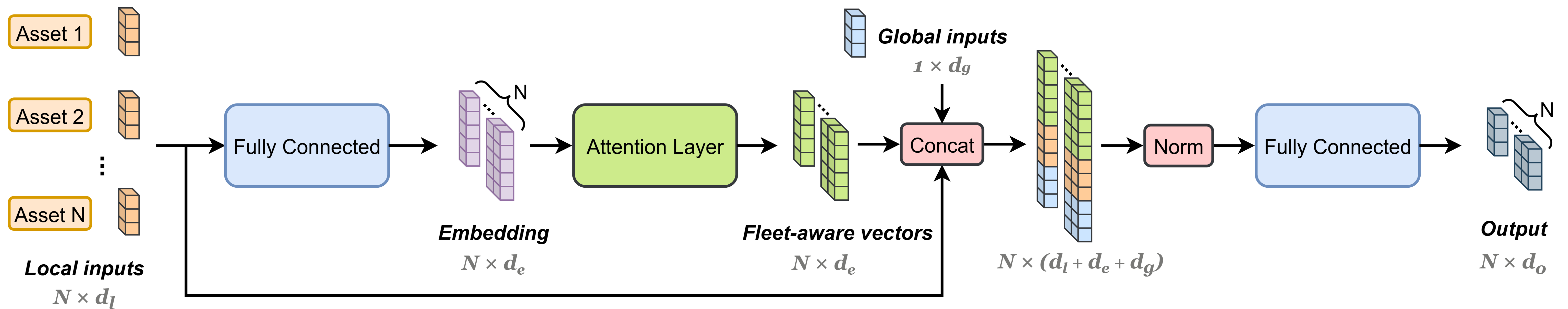


# SCALABLE ATTENTION-BASED RL FOR MULTI-ASSET CONTROL

Soroush Karimi, Giuseppe Gabriele, Bert Claessens, Chris Develder

AI4Energy, IDLab, Ghent University - imec



## Research Goal & Contribution:

- Joint control of a fleet of flexible assets to achieve a global objective/constraint
- Proposed approach:
  - Centralized** multi-asset control with global oversight
  - Scalable** with fixed input/output dimensions
  - Asset-specific aggregation** using attention mechanism
  - Fast**, using reinforcement learning (RL)

## Experiment & Key Takeaways:

- Control multiple electric vehicles (EVs) to flatten parking load
- Evaluated on two datasets:
  - 20 Belgian home EVs (historical)
  - 100 EVs (synthetic, scaled from historical)
- Proposed method outperforms rule-based controller (RBC) by 28%
- Average **peak power reduction of 27%** compared to RBC
- RL learns to prioritize EVs: **delay/anticipate** charging, based on flexibility & time of day

