



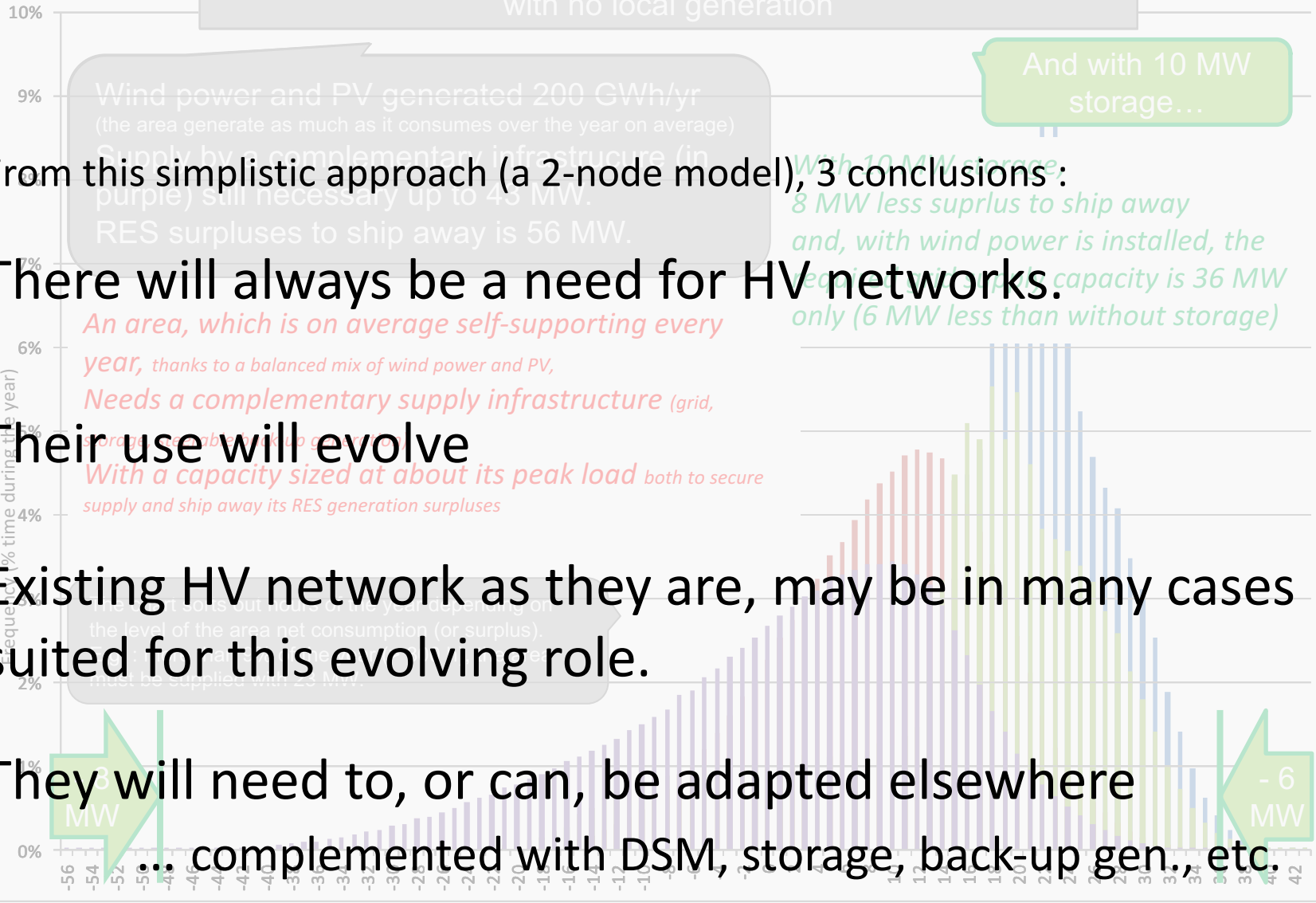
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Infrastructure needs for local communities

Do RES make 20-100 kV grid obsolete?

Supply of a 25000-inhabitant area
with no local generation



Wind power and PV generated 200 GWh/yr
(the area generate as much as it consumes over the year on average)

And with 10 MW storage...

From this simplistic approach (a 2-node model), 3 conclusions:

There will always be a need for HV networks.

An area, which is on average self-supporting every year, thanks to a balanced mix of wind power and PV, Needs a complementary supply infrastructure (grid, storage, substations, etc.)

Their use will evolve

With a capacity sized at about its peak load both to secure supply and ship away its RES generation surpluses

With 10 MW storage:
8 MW less surplus to ship away
and, with wind power is installed, the required capacity is 36 MW only (6 MW less than without storage)

Existing HV network as they are, may be in many cases suited for this evolving role.

They will need to, or can, be adapted elsewhere

... complemented with DSM, storage, back-up gen., etc.



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Thank you for your attention !

Rte ecomix - nouvelle version 2015



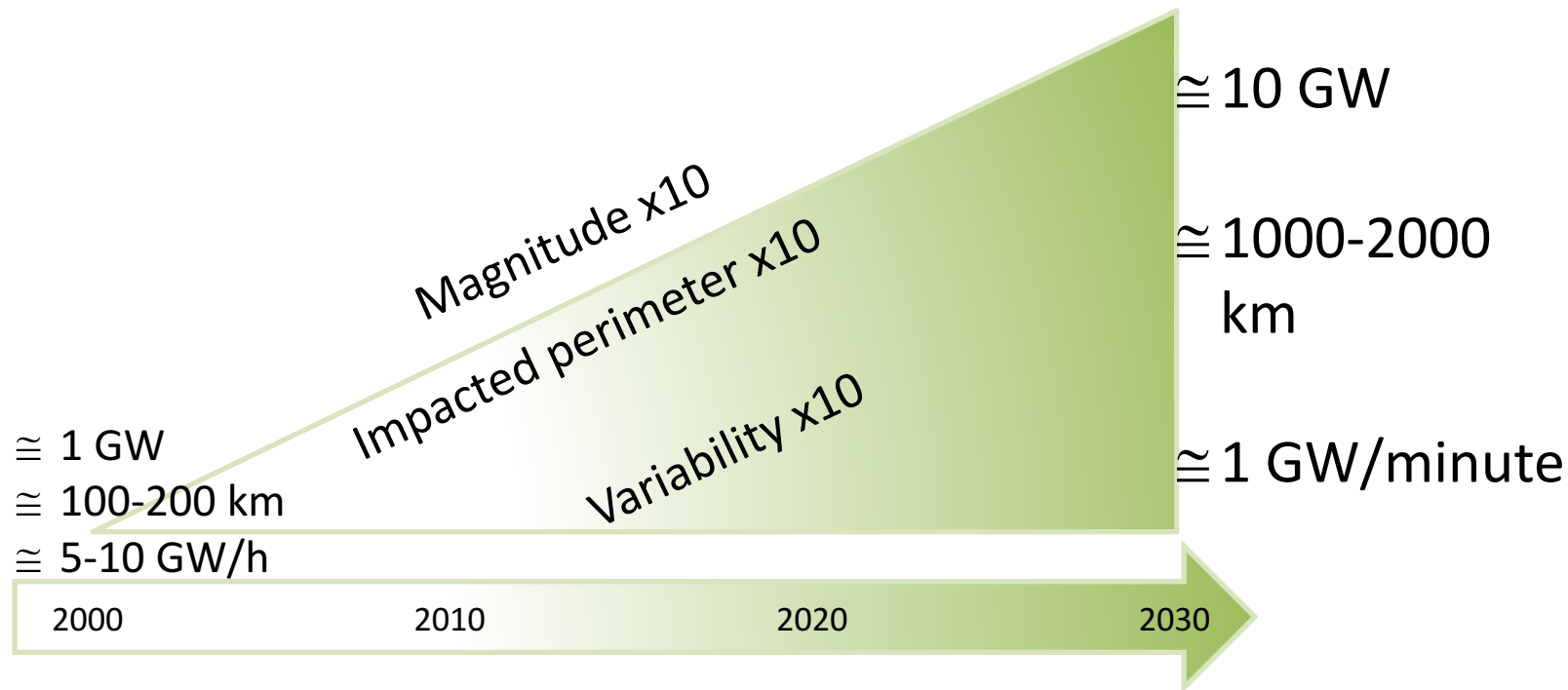
Available on the App Store

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RES induce larger, more distant and volatile power flows

Three multiplying scaling effects



Drivers for local HV grid development evolve

Yesterday

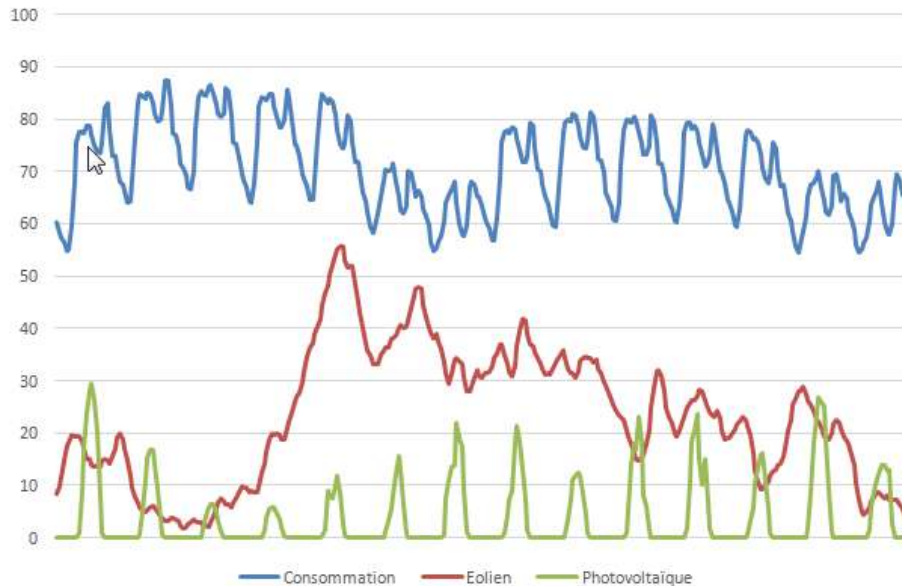
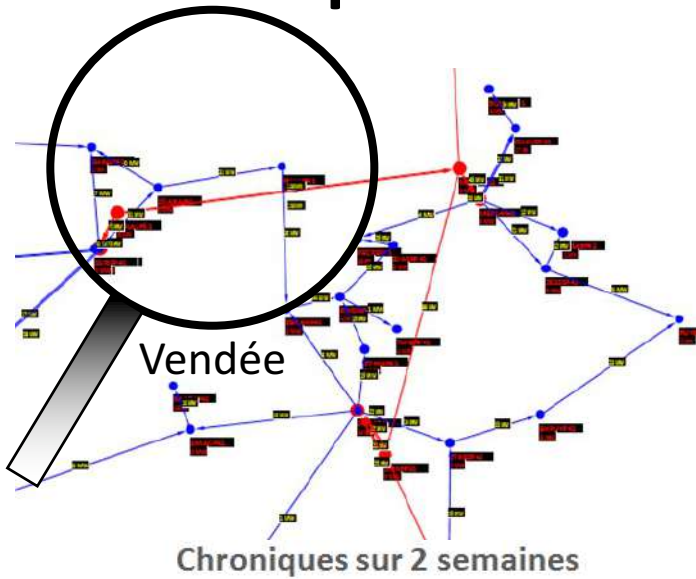
- Driver = load
- Peak load analysis
 - + peak summer + off-peak
- Monotonous load curves

- EENS, losses
- Deterministic

Tomorrow

- Driver = RES (\otimes load)
- Year-round (8760 h) analysis
 - \otimes load, wind, sun, hydro
- Chronological residual load curves
 - = load - RES
- EENS, curtailment, losses
- Probabilistic

iNod+: probabilistic N/N-1 analyses



iNod+

- Detailed modelling of 20-100 kV grids, adaptable topology
- Load & RES timeseries
- Probabilistic N/N-1 analyses

