

Artificial Intelligence *It's a Thing!*

NARUC ANNUAL MEETING AND
EDUCATION CONFERENCE

LEADING THE WAY
EXPLORING OPPORTUNITIES





ELECTRIC POWER
RESEARCH INSTITUTE

AI.EPRI

EPRI's Artificial Intelligence Initiative

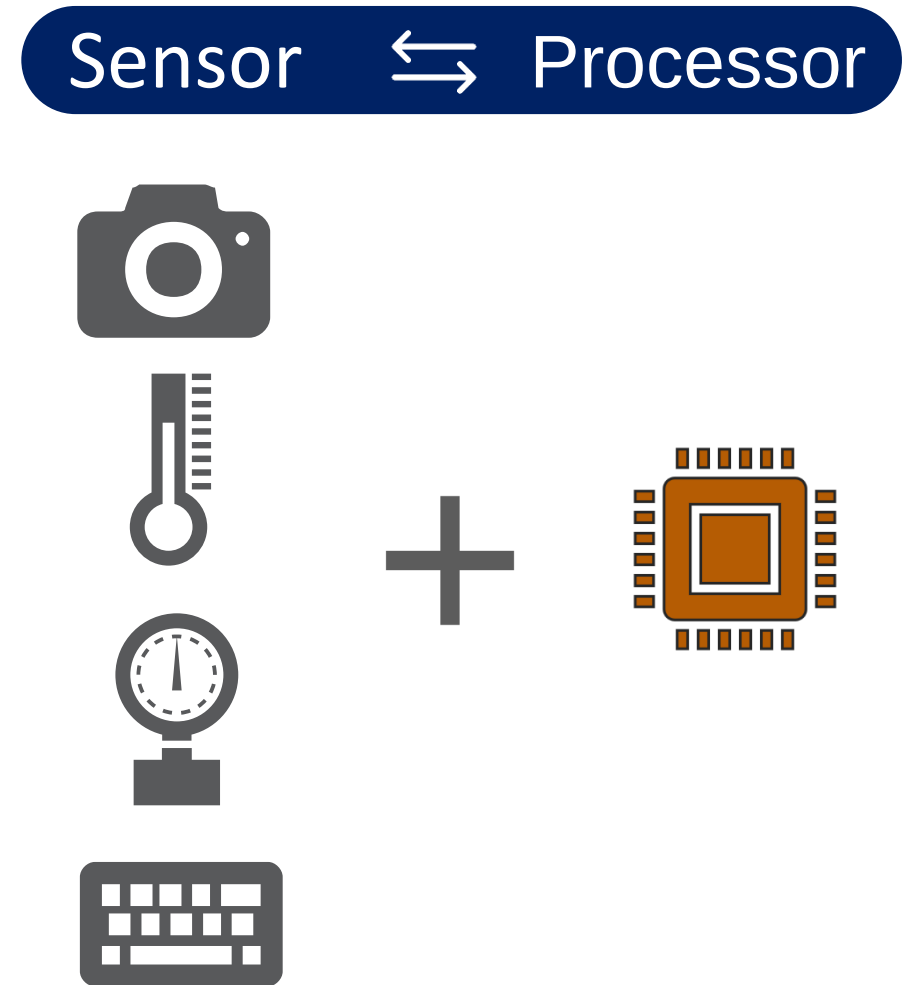
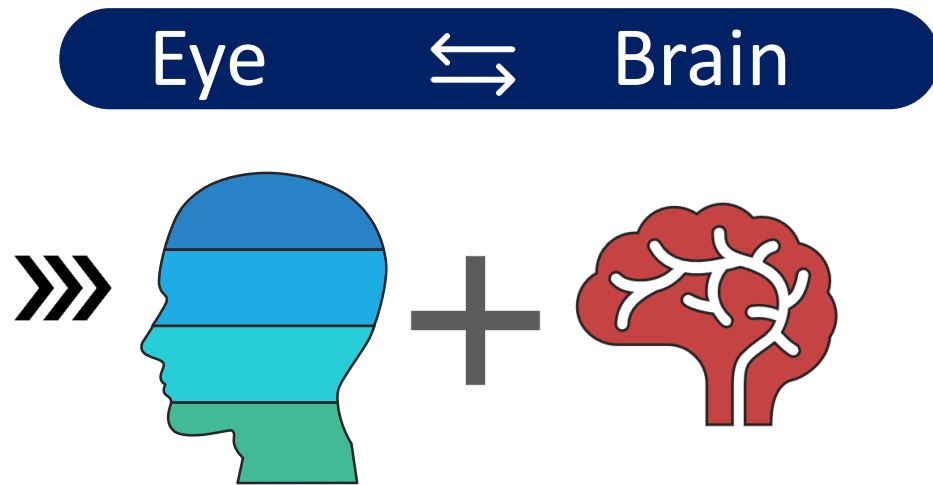
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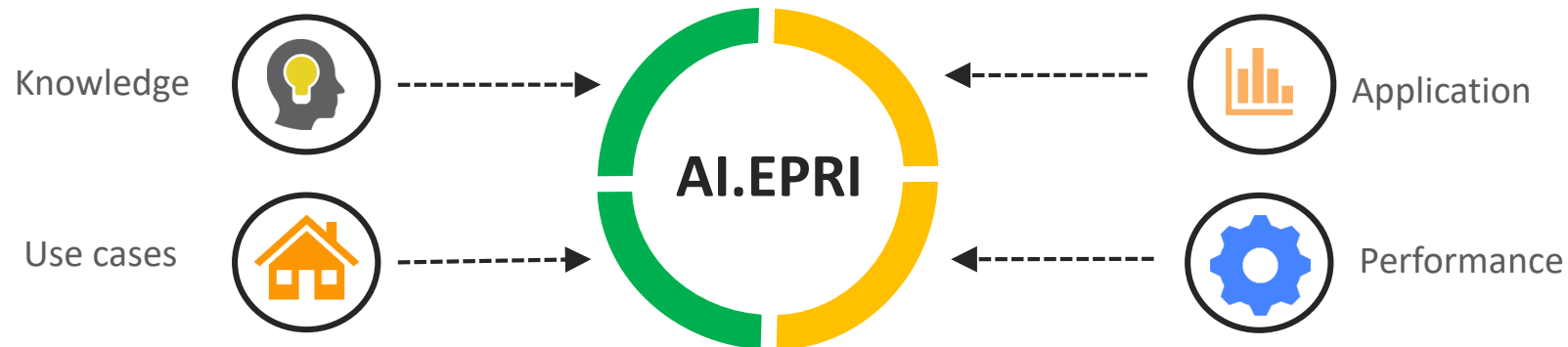
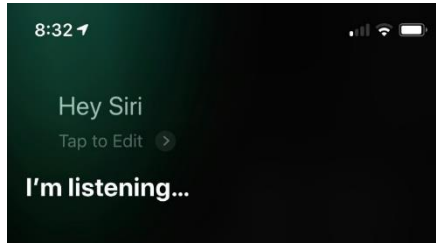
What does a 3 year old think?



AI – Inspired by Humans



Where are we as an industry?



Enable and Accelerate the Development, Application and Adoption off AI Technologies in the Electric Power Industry

What does a home security company think?



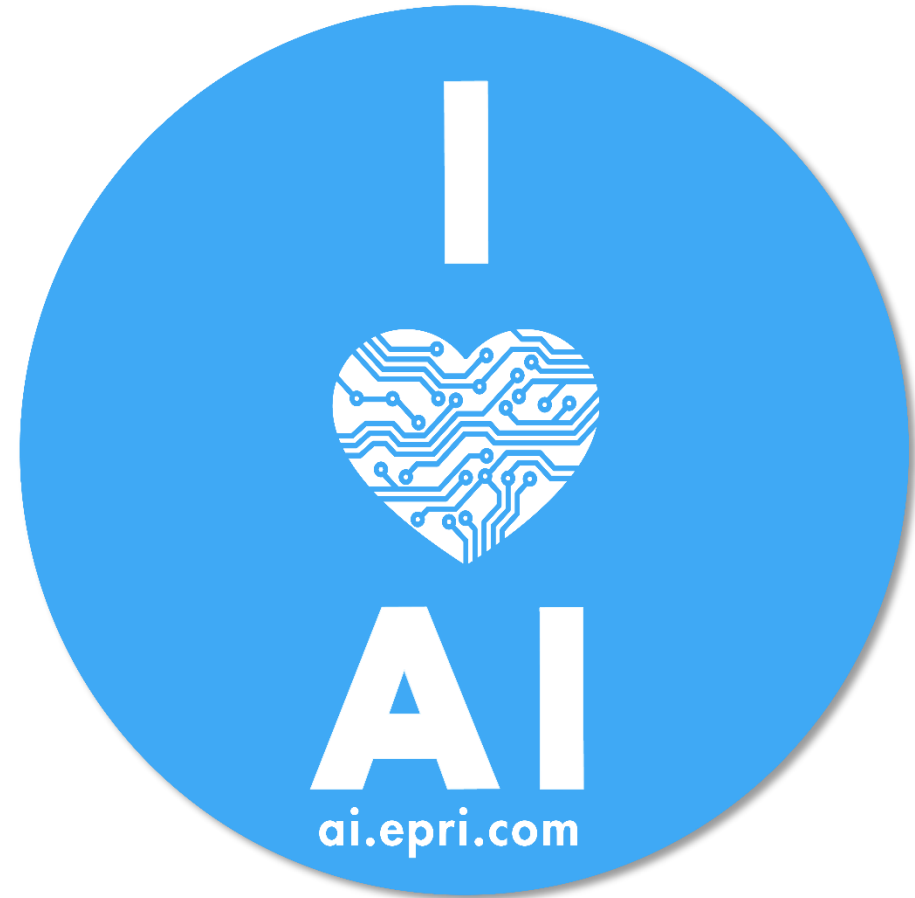
Connect with Us...

ai.epri.com

Events, AI whitepapers, AI projects and feedback

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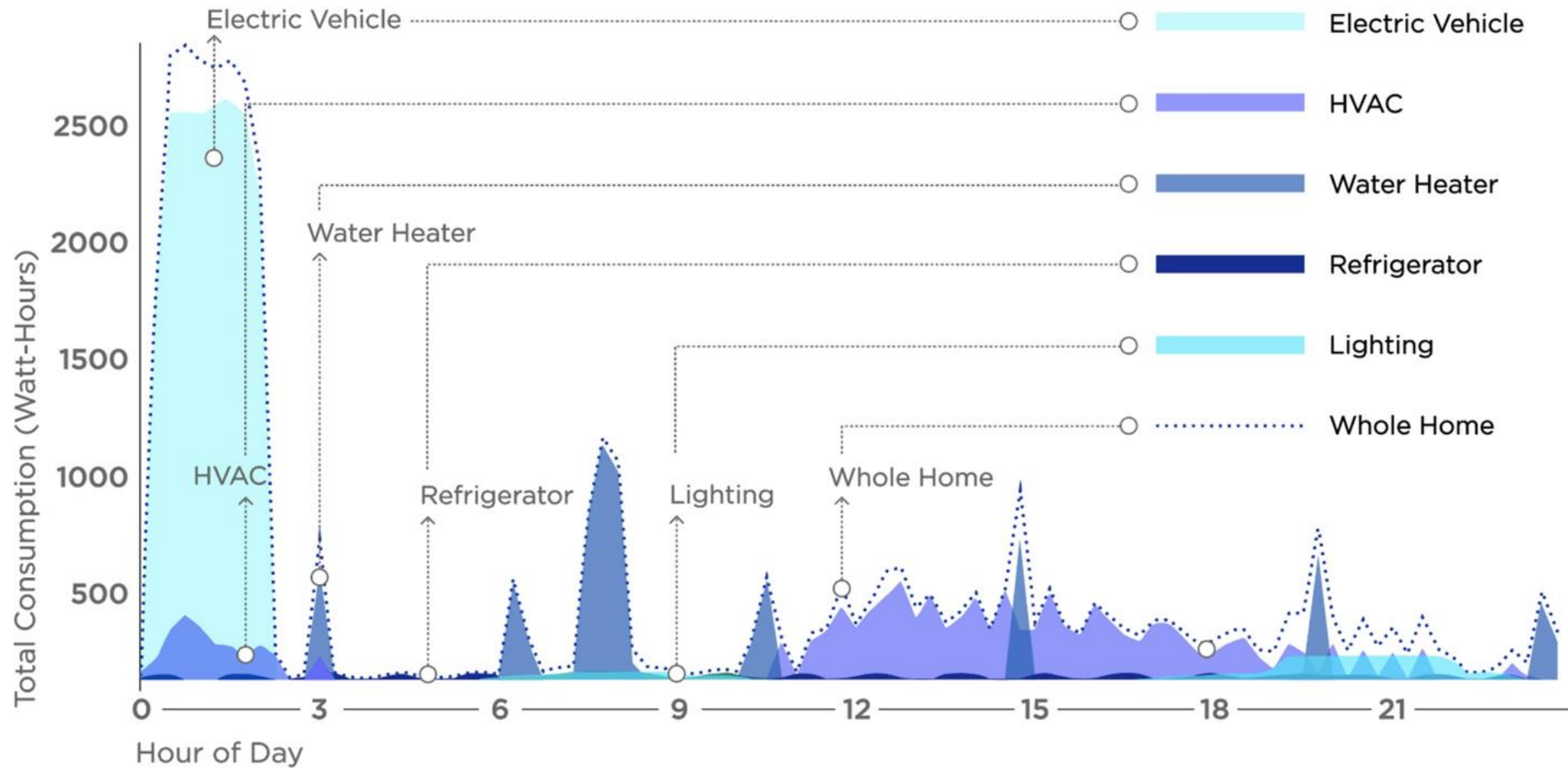


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14 Patents

No Hardware
Required

Applicable
for all Meter Types

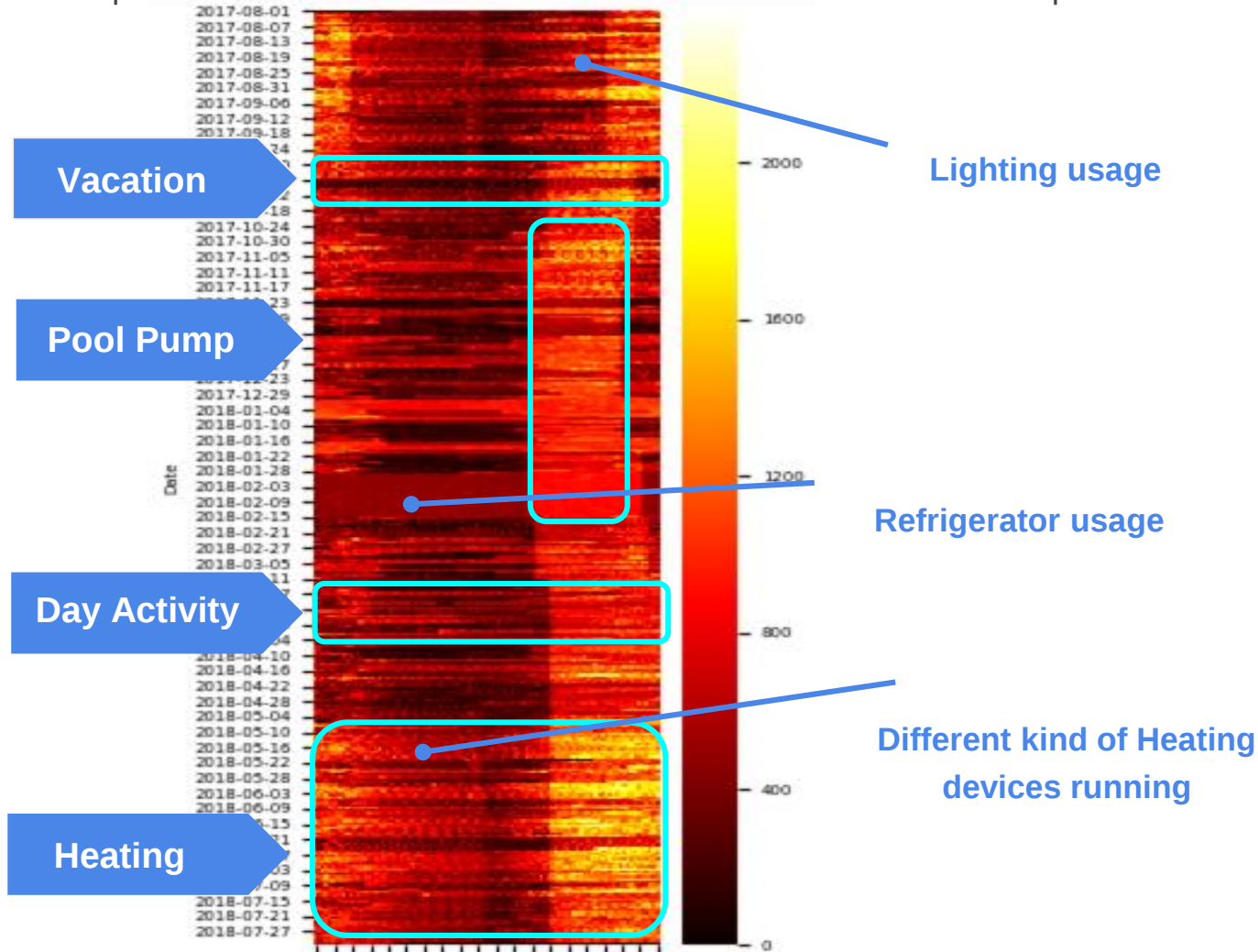
Zero Customer
inputs required

ENERGY DISAGGREGATION IN ACTION

Heatmap : Many Visible & Invisible

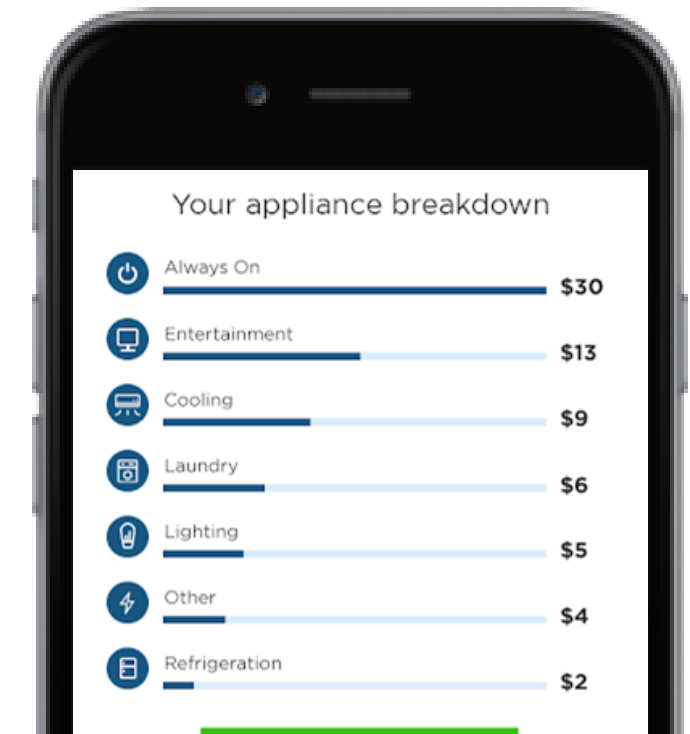
'Visible' examples

'Invisible' examples



100% Electricity Itemization

- Heating
- Cooling
- EV
- Always On
- Pool Pump
- Water Heater
- Refrigerator
- Lighting
- Cooking
- Laundry
- Entertainment
- PV (Solar)



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Nature's model for distributed grid management

Autonomous intelligence: a universe of possibilities

Why limit the possibilities to human intelligence?

Autonomous intelligence: a universe of possibilities

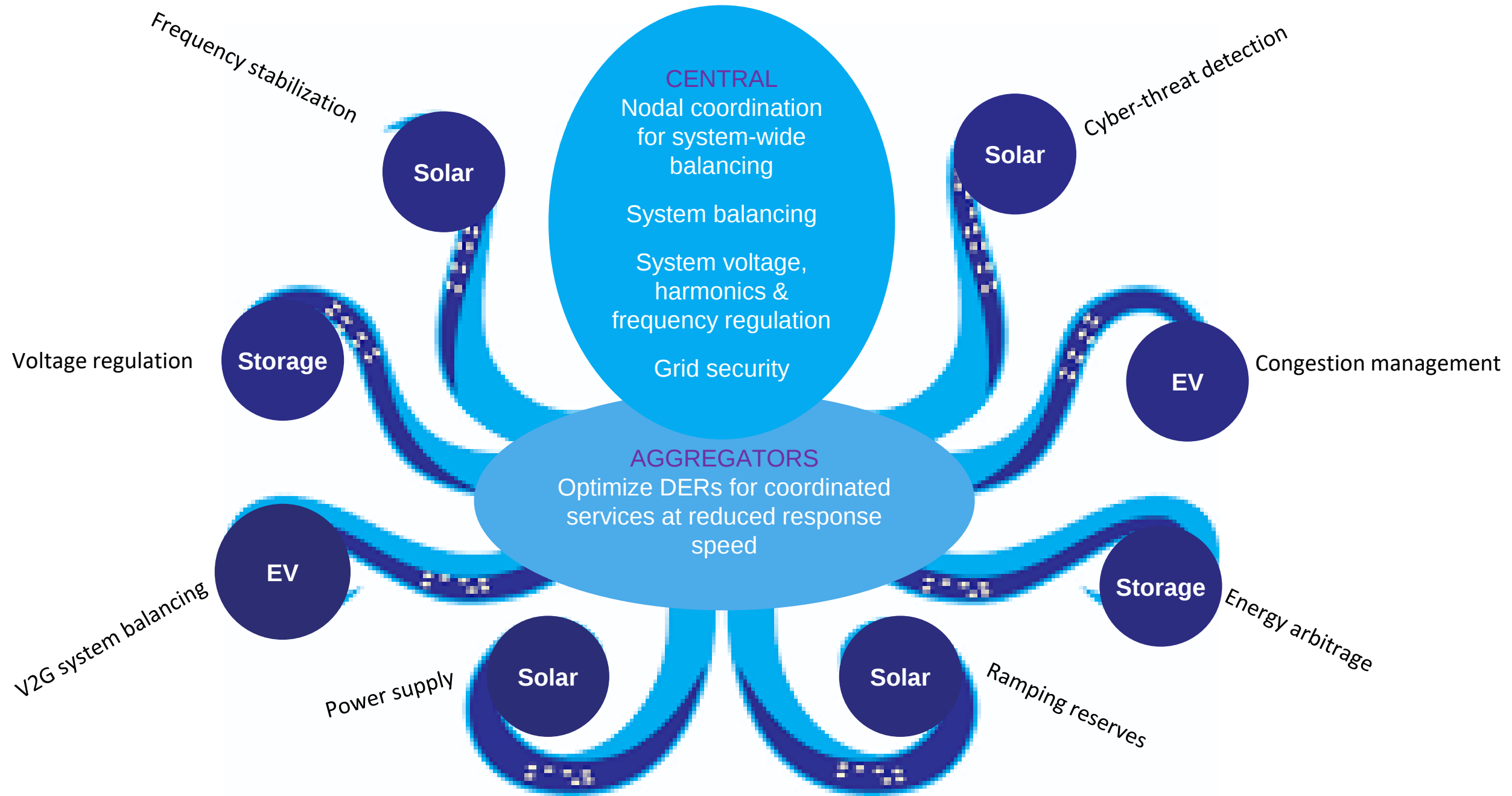
Why limit the possibilities to human intelligence?

“Researchers found that the brain of the octopus doesn’t have to do everything, because the arms, in effect, have a mind of their own.”

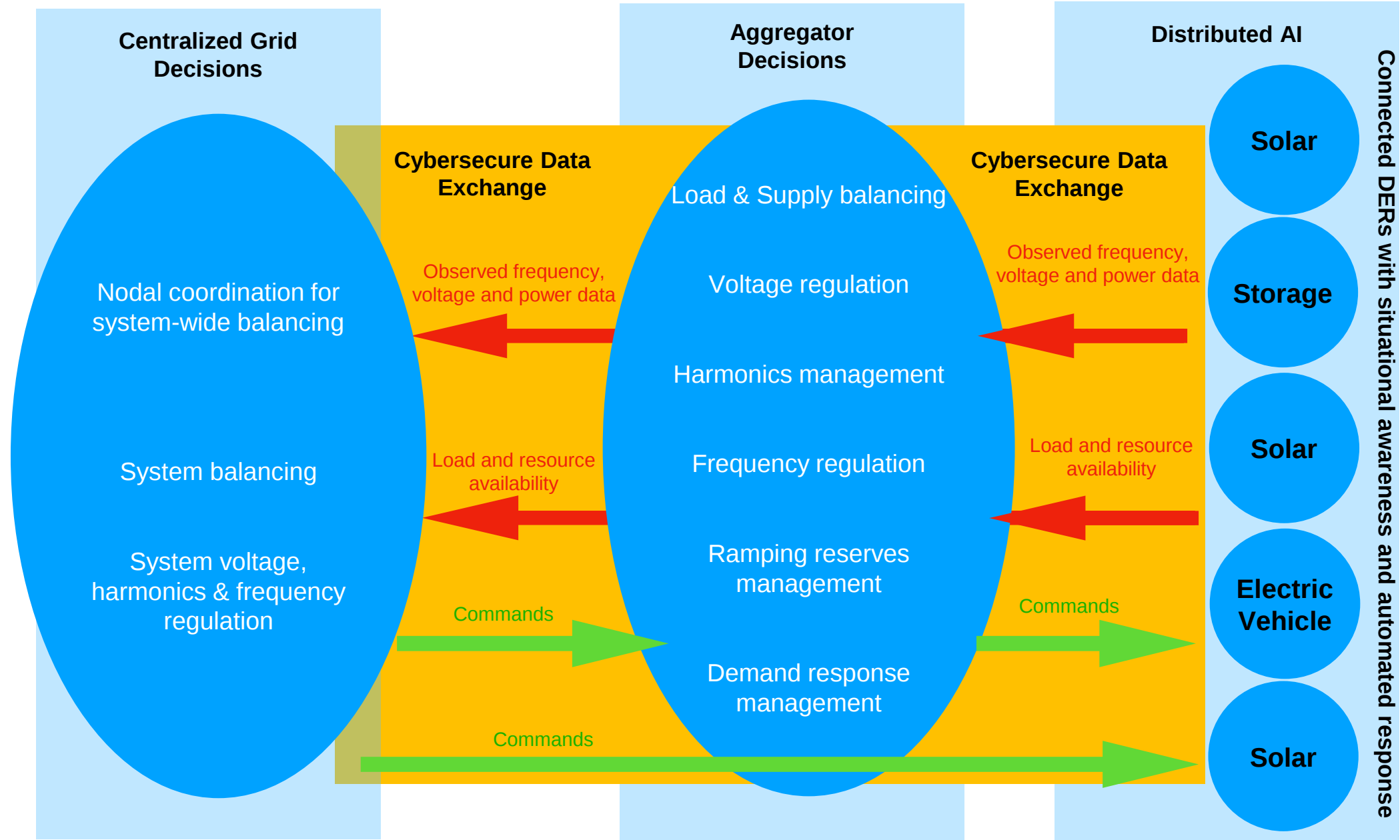
How is the electric grid like an octopus?



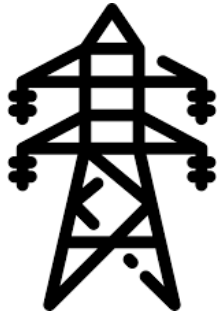
- Distributed neural network enables rapid response through embodied intelligence
- Bifurcated decision-making process
- Regional brain centers maximize computational power and optimize speed for complex decision-making
- Central control over trajectory and speed



Optimized, Cybersecure Transformation and Operation of Private Utility-tied Solar (OCTOPUS)



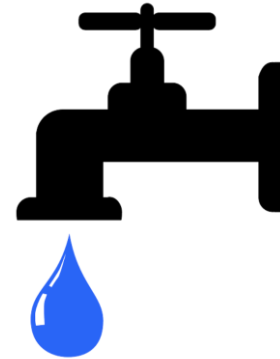
Utility: (n.) A organization supplying the public with a critical service within a regulated industry



Electricity



Natural
Gas



Water/
wastewater



Telecommunicaions

Data as the Fifth Utility

- What are the regulations?
- How is consumer data protected?
- How is grid cybersecurity ensured?
- Who owns the data?
- Who controls it?
- Who pays for the communications platform and who can profit from it?

Parallel example: Locational data in our lives

In 1983, the military's GPS data made publicly available (but scrambled)

In 2000, unscrambled data was made available through presidential mandate

First iPhone released 2007, with Google Maps - which was then officially released in 2008



mapmyrun

Dozens of companies use smartphone locations to help advertisers and even hedge funds. They say it's anonymous, but the data shows how personal it is.

Your Apps Know Where You Were Last Night, and They're Not Keeping It Secret

By [JENNIFER VALENTINO-DeVRIES](#), [NATASHA SINGER](#), MICHAEL H. KELLER and AARON KROLIK DEC. 10, 2018

And it's for sale.

Data reviewed by The Times shows over 235 million locations captured from more than 1.2 million unique devices during a three-day period in 2017.

Replay

In about four months' of data reviewed by The Times, her location was recorded over 8,600 times — on average, once every 21 minutes.

Ex-boyfriend's

Hiking

To airport

How is the electric grid like an octopus?



- Distributed neural network enables rapid response through embodied intelligence
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To unleash the full potential of AI to transform the
electricity industry,
we need to first address data.

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