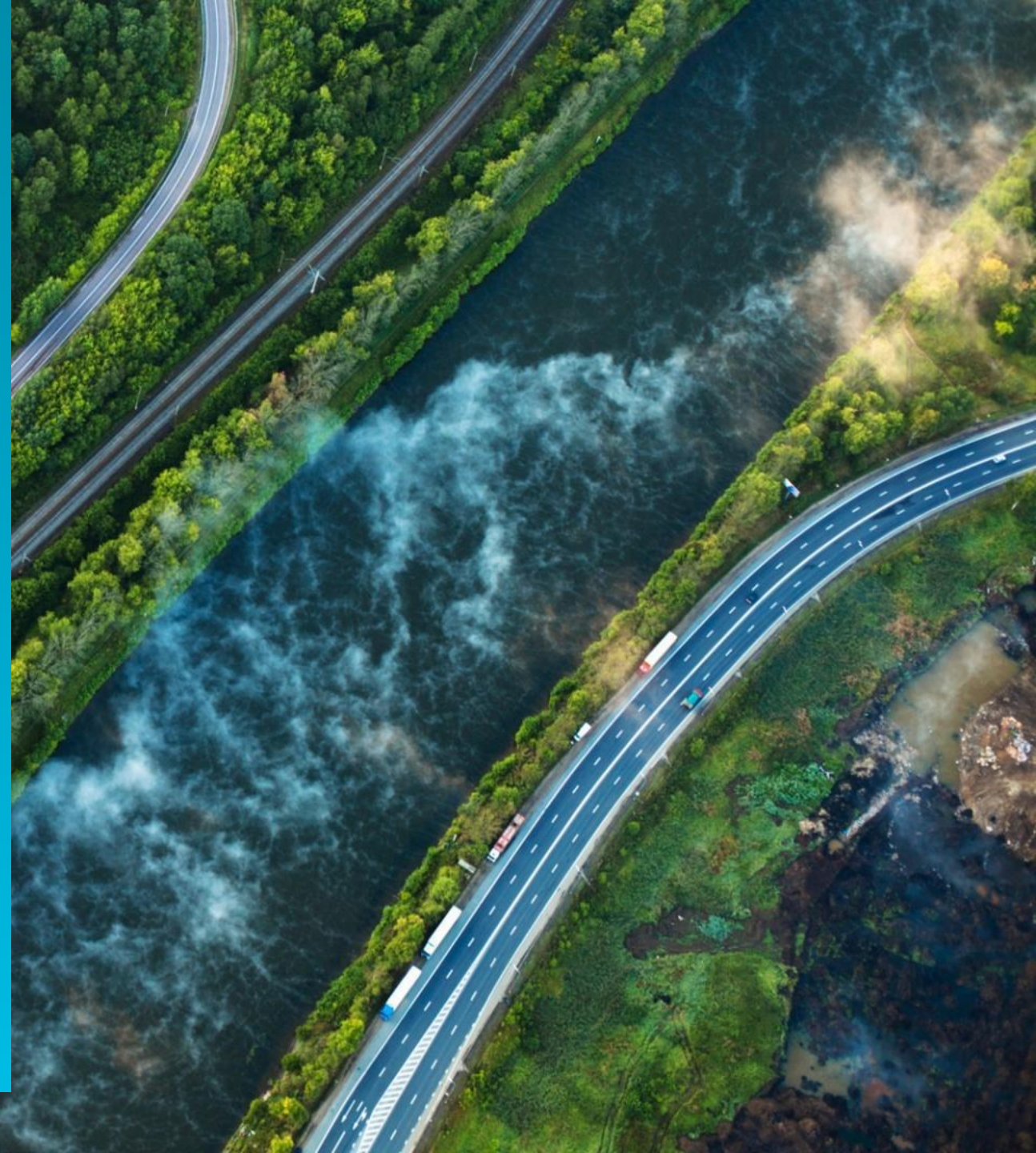




Grid Data + Communication as an Enabler of Net Zero Buildings

AEG WASHINGTON STAKEHOLDER
CHALLENGE
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Eight Step Journey to Building Decarbonization

1 Goal Setting & Advisory Services

- Cultural and organization-wide alignment
- GHG inventory (Scope 1,2,3) baseline
- Decarbonization roadmap and strategy
- Financial assessment and solutions
- Peer and market benchmarking

2 Master planning Safe, Secure, Healthy Environments

- Building code compliance for occupant safety
- Indoor air quality and ventilation
- Fire safety, building and cyber security strategies and technologies
- Industry-leading certification of health and safety (i.e. BOMA/WELL)

3 Digitally Enabled Environments

- Energy management information systems
- Streamlined data acquisition
- Data-driven building decision-making using predictive, automated, responsive capabilities
- Leveraging digital models for master planning and scenario assessment
- Transparent, traceable decarbonization dashboards

4 Efficient Infrastructure

- Savings and outcome-based energy efficiency program
- Deferred maintenance resolution
- Infrastructure resiliency
- Electrification solutions
- Portfolio energy management
- Waste Management
- Water Conservation

5 Sustainable Operations

- Continuous decarbonization operations management plan
- Training or staffing future-ready infrastructure experts
- Sustainable lifecycle management and technology obsolescence planning
- Condition-based, predictive maintenance

6 Distributed Energy Resources

- Distributed Energy Strategy
- On-Site Renewable Energy Generation
- On-site Storage
- Grid Interactive Services
- Advanced Asset Optimization
- Demand Response Services

7 EV Charging Renewable Energy Supply Services

- Renewable Energy Advisory
- Renewable Energy Procurement (PPAs, VPPAs, RECs, RNG)
- Carbon Offsets
- Energy Supply (Budget) & Billing Mgmt
- Renewable Finance, Development & Trading

8 Certify & Recognize Impact

- Transparent, traceable decarbonization dashboards, accounting and reporting
- Brand public relations and communications
- Industry-leading certifications facilitation

The Challenge

BUILDINGS MUST...

Keep occupants **healthy, safe, comfortable & productive**

At the lowest possible **cost & environmental impact**

BUILDINGS CAN...

Adjust **temperature, ventilation, light levels,** etc.

Organize and **arrange occupants**

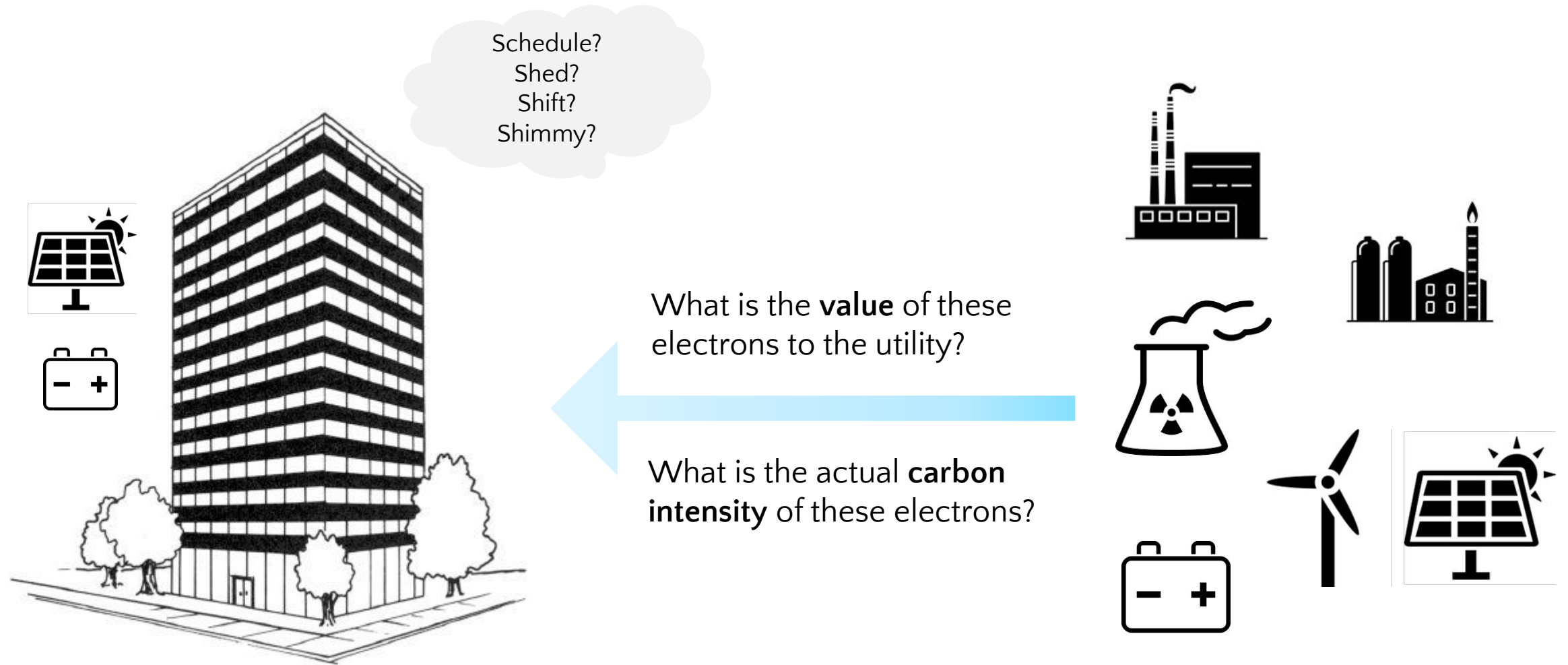
Draw electricity **from the grid** and **send it back**

But *when* should buildings do **these ?...**

...to *maximize* the benefits of **these ?**



The Obstacle



If building asset owners see the value of load flexibility, they will participate in the market.

Benefits & Consequences

Less visibility to electricity cost & carbon data

The market transforms slowly...

- Building owners not incentivized to be a resource on the grid
- Lower adoption of energy optimization solutions
- Some productivity disruptions from traditional DR
- **Businesses have less control over their Scope 2 and 3 emissions**

The grid is less balanced...

- More reliance on fossil peaker plants
- **Lower utilization rate of renewable energy**
- More pressure on retail electric rates

More visibility to electricity cost & carbon data

The market transforms faster...

- Building owners compensated for the value they provide to the grid
- Building retrofits include advanced BAS & DER
- Building occupants remain safe, healthy, productive, and comfortable
- **Businesses achieve their Scope 1, 2, and 3 emissions goals**
- **Alternative BEPS Compliance Path?**

The grid is more balanced...

- Less reliance on fossil peaker plants
- **Faster achievement of DC's GHG & renewable energy goals**
- Less impact on retail electric rates

Regarding Buildings and Construction, to achieve Washington D.C.'s Carbon & Equity goals, a critical obstacle for Johnson Controls to overcome is **data to assess the true value of electricity.**