

# Smart Grids & EV Charging

## AI Opportunities in Green Energy

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**\$15.7tr**

Potential contribution to the global economy by 2030 from AI

**+26%**

Up to 26% boost in GDP for local economies from AI by 2030

**~300**

AI use cases identified and rated are captured in our AI Impact Index

Source: PwC

## The Challenge: Grid Is Under Attack

- \$1T gas fueling infra and ecosystem is SHIFTING due to electrification
- AI's GDP impact will be energy intensive
  - Potential 14% GDP boost will literally be powered by electric Grids
  - AI everywhere, computationally intensive GPU server farms

## Decision Point for Smart Grid Companies

- Be the industry disruptor as an AI-first company
  - Bridge the talent and culture gap, and start building POCs?
  - Or wait-and-watch for use cases to emerge?
- Get intimate with data and begin gaining deeper insights
- How to transition from a data-first to an AI-first company
  - Optimize data for decision-making
  - Get intimate with your data: Conversational interface to data, models & actions



# AI Case Study: Challenges with EV Infrastructure

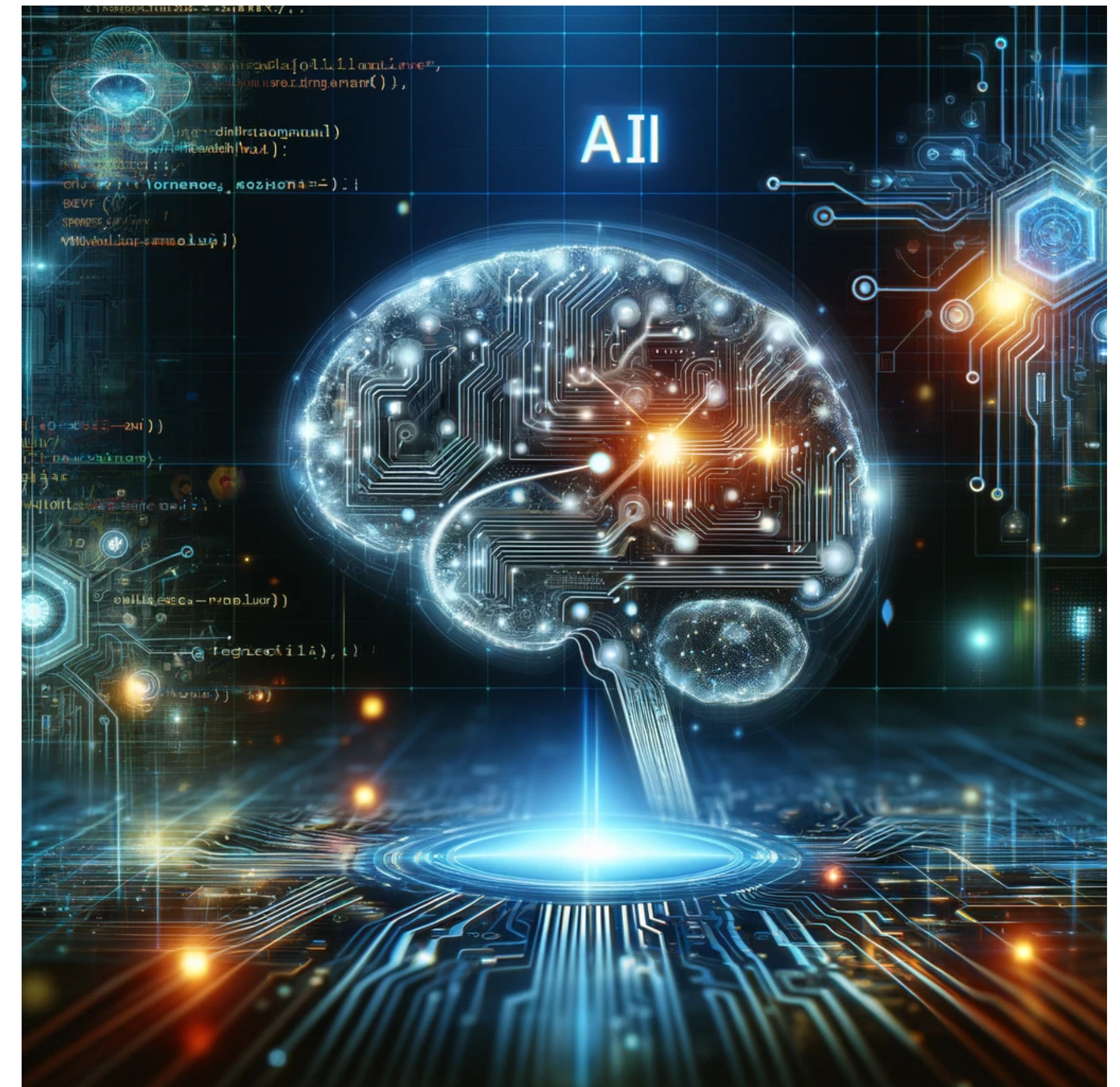
- Use Case: Poor Utilization
  - Plenty of charging stations
  - Poor location choices
  - Business model failed to encourage public charging
- Other Use Cases:
  - Fluctuating demand management
  - Grid strain and adaptive pricing
  - Peak demand mitigation





# AI Case Study: EV Charging Solution

- AI-First Approach
  - AI-centric redesign
  - Models designed for efficient utilization
  - New build-out at point-of-interest granularity
  - Use proprietary, partner and public data





## AI Case Study: EV Charging Solution

- Datasets used
  - 1st-party, 2nd-party and 3rd-party datasets
  - Harness as much impacting data as possible
    - EV charging data
    - Demographic data
    - Mobility data
    - POI data
    - EV ownership data
    - Various utility infrastructure geometric data (feeder level)





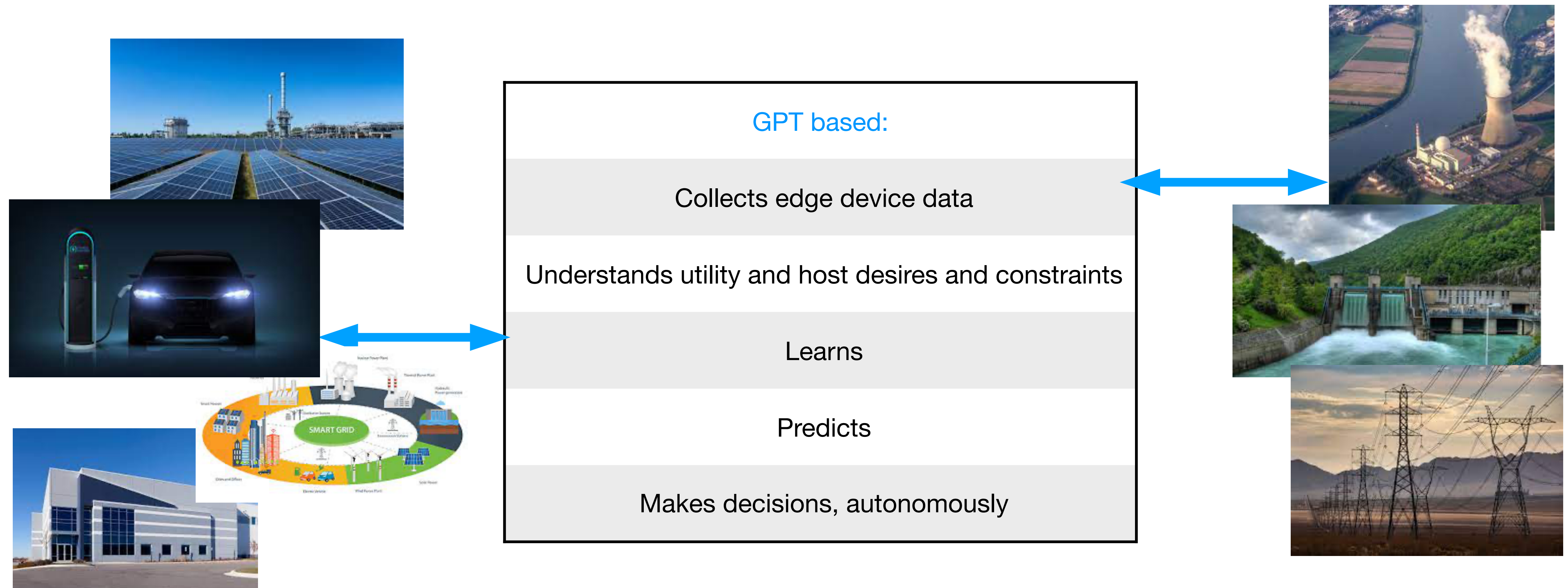
## AI Case Study: EV Charging Solution

- AI Model Architecture
  - Algorithmic inference engine created to predict demand satisfaction curves
  - Model dwell times, visitation profiles, charging behaviors
  - Serve essential charging need
  - Disincentivize opportunistic charging
  - Load analysis based on existing utilities infra
  - Leverage 3rd-party AI models for EV predictions, impact to local economy, jobs growth and environment and health impact





## EV Charging Solution: An AI-enabled Autonomous Grid-Edge Energy System





## Key Value Propositions to Host

- Optimize for what is important (cost, green energy)
- Apply time-based constraints
- Conversational (LLM) interface to data, models and actions
- Power-efficient charging, lower installation costs, optimized to dwell points, travel needs and duty-cycle needs





## Key Value Propositions to Utilities

- Grid conformance system
- Grid resiliency
- Peak demand management
- Time-of-use pricing
- Avoid site infrastructure upgrade when possible





# Key Value Propositions to the AI-First Customer

- AI models led to a SaaS-based tool
- Interested utilities
- A brand new revenue stream for the customer





## What does it mean to be an “AI-First Company”?

<b>Product</b>	AI is a key product/module offering that unlocks value for your customers.
<b>Roadmap</b>	Data acquisition strategies and model development and integration are integral to the product roadmap.
<b>Operations</b>	AI is integrated into your internal process/workflows; improving quality and velocity of decisions.
<b>Culture</b>	You have an environment that supports focused “experiments”, similar to the scientific research culture.

## Key Takeaways

- Worthwhile to consider becoming an AI-First Company
- Start with a well-planned Proof of Concept. We reviewed:
  - a case study to fix poor utilization of an EV Charging network
  - Smart Grids have a variety of data to model and learn from
  - AI application provide value to you, customers and partners
- AI culture of experimentation complements engineering culture

## What services do I offer as an “AI Consultant”?

**Kickstart your AI journey** Get you started with a Proof of Concept (POC): identify a business use case, seed the “Experimentation” culture through a core AI team

**Stand up POCs** POC may be any of these depending on the use case: advanced insights, predictive models, optimization models, LLM-led conversational experiment

**Deliverables** All services are tied to specific deliverables, such as:

- a quick experiment, a model and assessment of initial performance
- datagap analysis and improvement strategies
- learnings about AI possibilities with your specific data
- strategies: AI strategy going forward, roadmap, organization, processes