Smart from the Start:
How flexibility services drive grid resilience

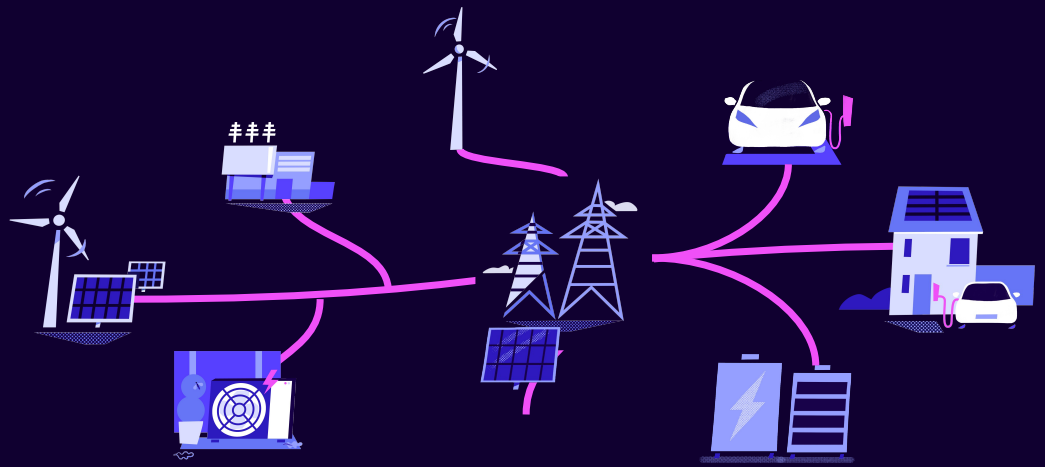
ACEF Pre-forum UK Session
Manila, Philippines June 2026

KRAKEN

A changing power system

The centralised power model that legacy infrastructure was designed for is evolving

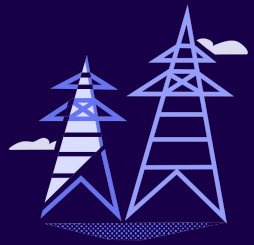
Old world	New world
Unidirectional	Bidirectional
Centralised	Distributed
Dispatchable	Intermittent
Static	Volatile



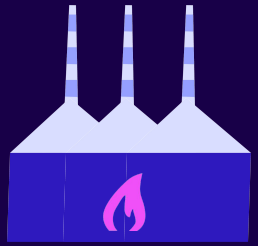
A market in transition

Southeast Asia's electricity grid is rapidly changing

Electricity demand is expected to rise by 4% annually to 2035 .[1]



$29 billion USD investment required in new grid infrastructure.[2]



Rising temperatures decrease the availability of thermal and hydropower assets, which in turn creates challenges for grid infrastructure.[3]

1. IEA Southeast Asia Energy Outlook, 2. Bain & Company and Standard Chartered Southeast Asia's Green Economy 2026 Report: The New Calculus, 3. International Energy Agency, World Energy Outlook 2025.

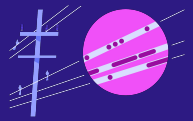
The opportunity

Integrating flexibility services helps utilities transition to two-way power grids

Flexibility ‘toolkit’

Supply-side flexibility

Demand-side flexibility



Network & digital tools

Utilities can more effectively manage a dynamic grid by utilising a multi-dimensional flexibility toolkit

The value of flexibility at scale

Utilities in Southeast Asia can use flexibility to improve operations and reduce costs

Permanent cost drivers

- Imported fuel price volatility
- High demand periods placing stress on grid infrastructure
- Higher capital expenditure is required to connect and reinforce geographically remote regions

Flexibility value enablers

- Coordinating flexible assets reduces high-cost localised fossil peaking generation
- Orchestration of consumer DER can reduce congestion and defer CAPEX
- Leveraging consumer DER to scale and improve reliability of microgrids

Managing consumer flexibility at scale will fundamentally change the utility operating model

Utility functional layers

	Physical	Operations	Market/Services
 **Consumer flexibility at scale**	The physical grid is shifting to a bidirectional system where the network edge becomes load bearing	Low-voltage networks transition from passive to active management - Distribution System Operator (DSO) model	Innovative pricing arrangements to incentivise customers

Case study on bringing flexibility to life for Utilities

Northern Power Grid and Octopus Energy trialled dynamic pricing in the UK

NPG changed pricing using forecasted load

NPG serves 3.8m meters across England & Scotland

Pricing optimisation trial across a few substations

Grid pricing increases as congestion increases; added on top of existing grid tariffs (set by regulator)

If dynamic pricing scales across full NPG grid, potential....

-20%
Peak load

£600m
Cost savings

+10 yrs
Capex deferral

Source: Case study conducted using the Kraken platform across Grid and Residential Flexibility

Illustrative data sharing cycle across market participants

NORTHERN POWERGRID — DSO

Input
Grid topology & telemetry from substations

Output
Forecasting & calculation of DNP (existing ToU tariff + "congestion overlay")

Dynamic network price

octopus energy — Retailer/Aggregator

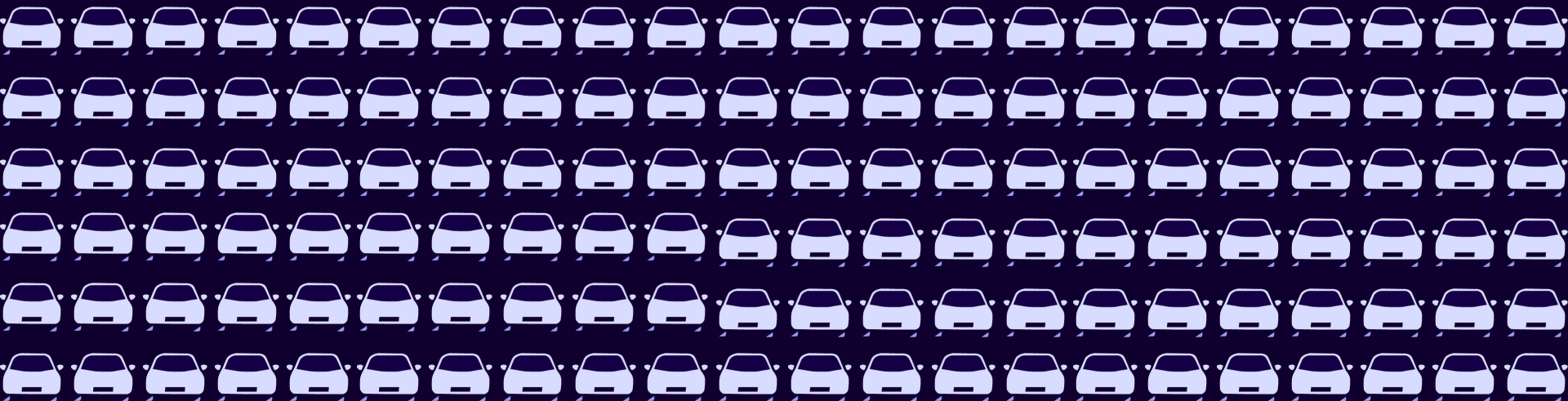
Input
DNP, wholesale energy price & customer preferences

Output
Optimisation of residential flexibilities across portfolio

Optimised dispatch

Consumers with connected EVs

Pilots test technology
… scale reveals truth!



Thank you!

Please reach out with any queries.

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