



DEMA
ENERGY

Creating Balanced Energy Networks for the Future



Founded in 2021, DEMA Energy is a Saudi company at the intersection of **technology** and **energy**, offering a suite of **optimization services** to the electrical grid



هيئة تنظيم الخدمات العامة
Authority for Public Services Regulation



جامعة الملك فهد للبترول والمعادن
King Fahd University of Petroleum & Minerals



الهيئة الملكية للجبيل وينبع
Royal Commission for Jubail & Yanbu



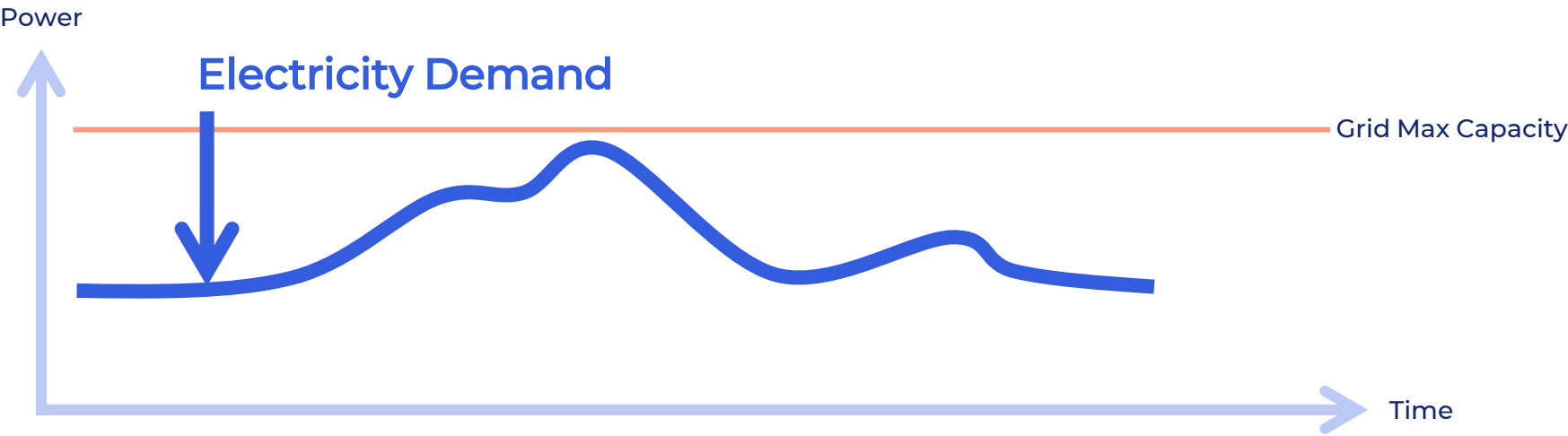
هيئة الاتصالات والفضاء والتقنية
Communications, Space & Technology Commission



DEMA Site, Texas, US



Transitioning to renewable energy poses challenges for grid stability, requiring enhanced flexibility to manage unpredictable supply and fluctuating demand



Depending on supply-side flexibility with renewables energy to be %50 of supply capacity will be challenging

Unpredictability of Renewable Energy

Outputs of renewable energy vary with weather conditions, causing difficulties in accurately forecasting supply and increasing grid instability risks

Over-Reliance on Backup Systems

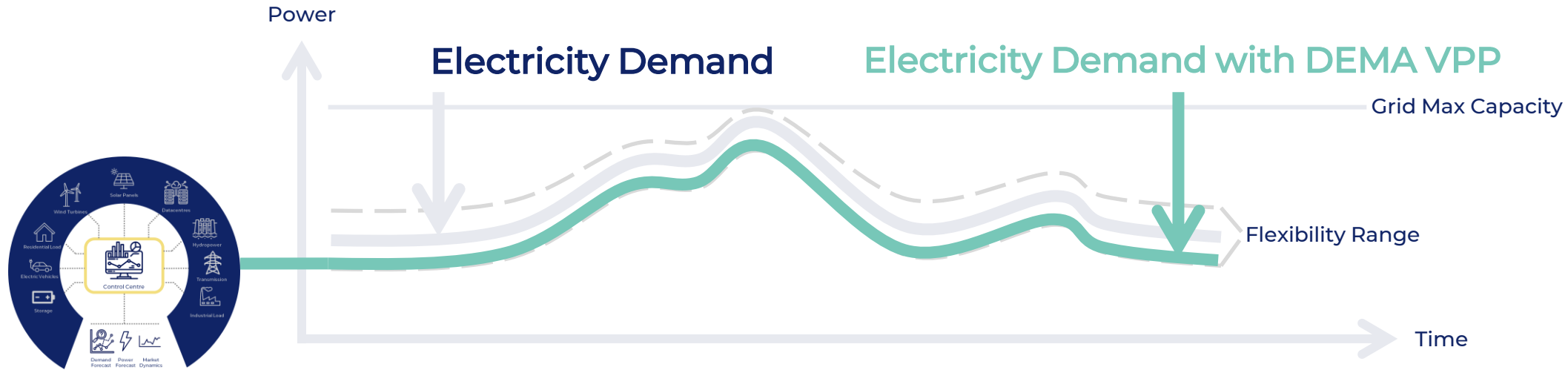
Dependence on backup power sources leads to higher operational costs and an elevated risk of blackouts

Imbalance Between Supply and Demand

Misjudgment of renewable energy availability can result in supply-demand imbalances, potentially triggering blackouts



DEMA Virtual Power Plant (VPP) is a demand-side flexibility software designed to manage and reduce electricity demand during grid stress



DEMA VPP™

Reduce Peak Load

Lowering demand during critical periods to enhance grid stability

Reduce Emissions

Promoting sustainable energy practices by minimizing carbon footprints

Payment for Load Owners

Providing financial incentives for consumers contributing to load reduction

Defer infrastructure Investments

Reducing the need for costly grid upgrades by optimizing existing resources

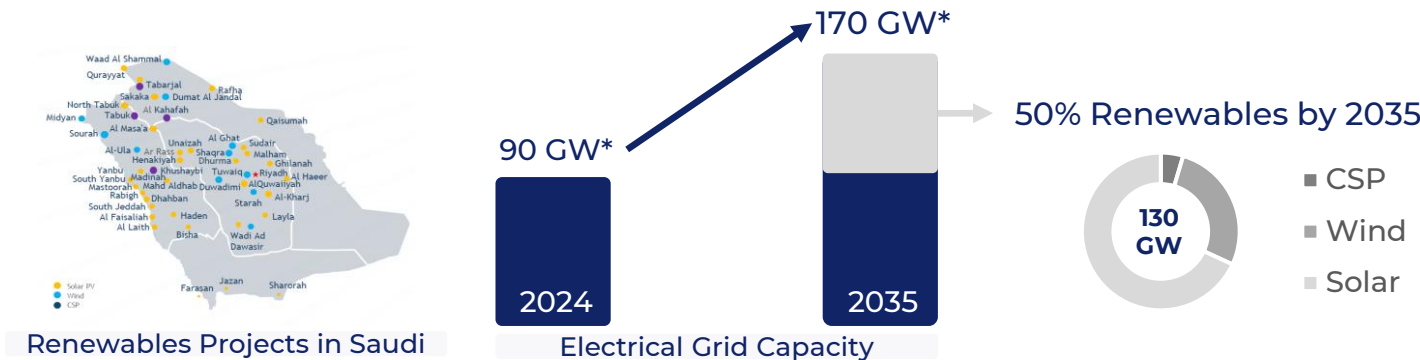


The Saudi market growth is driven by renewables transition and growing demand

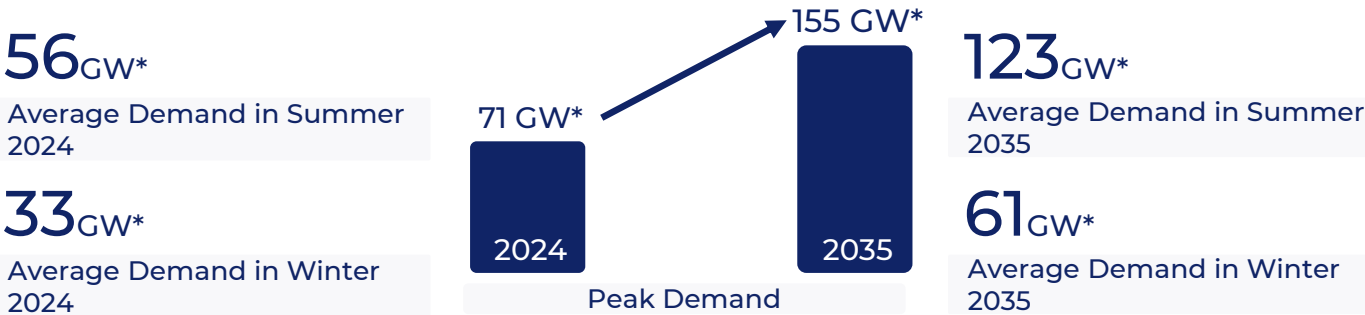
\$1B

Annual cost savings

in 2024



Renewables Transition



Growing Demand



2024

DEMAND SIDE MANAGEMENT IN KSA

1GW

28_h

Demand Response Capacity

Demand Response Duration

\$ 13_M

Compensation Paid to Participants



2.7_{GW}

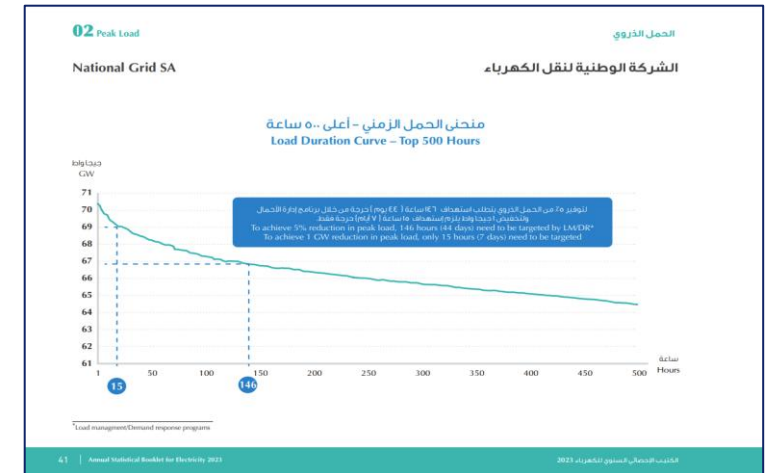
70_h

Demand Response Capacity

Demand Response Duration

\$ 33_M

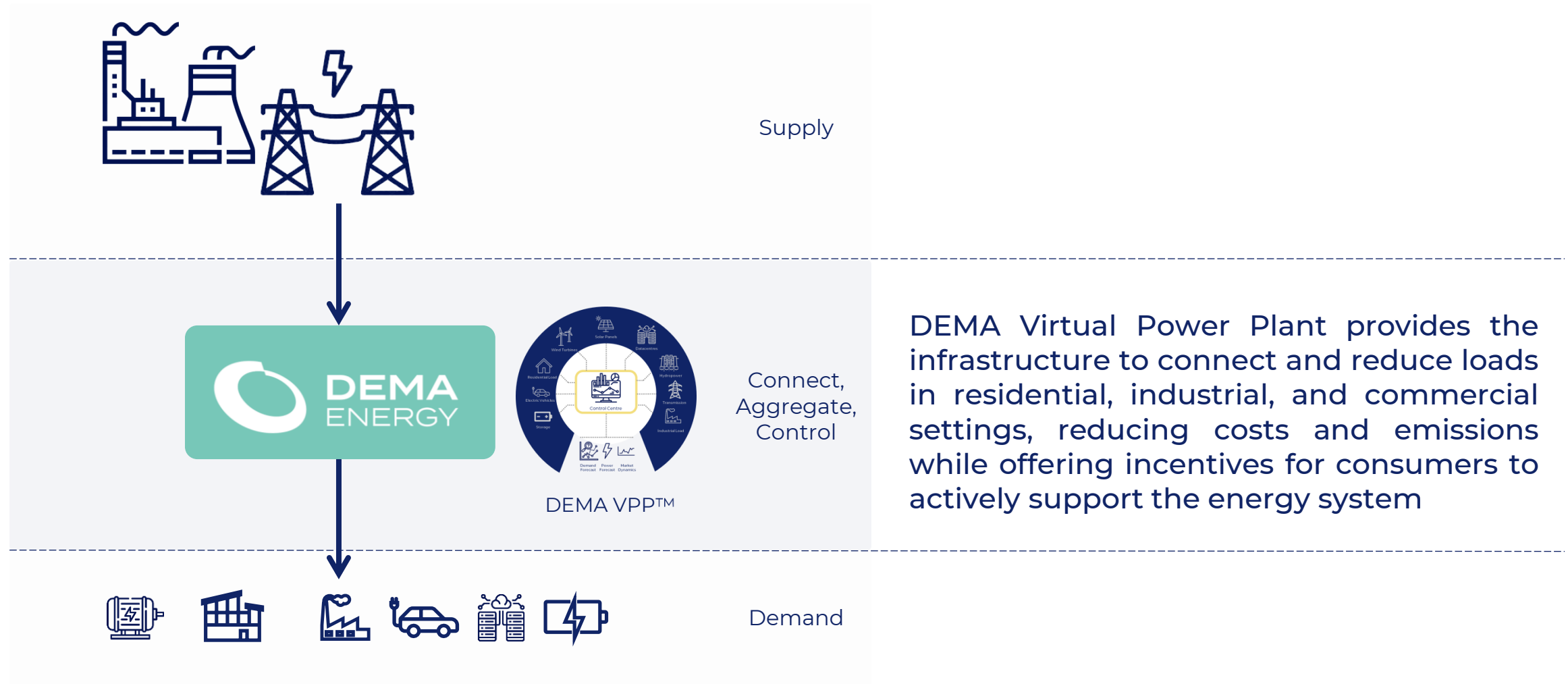
Expected Compensation Paid to Participants



SERA the regulator is focusing on load management and demand response to reduce the peak load. Targeting 5% load reduction with targeted duration of 146 hour

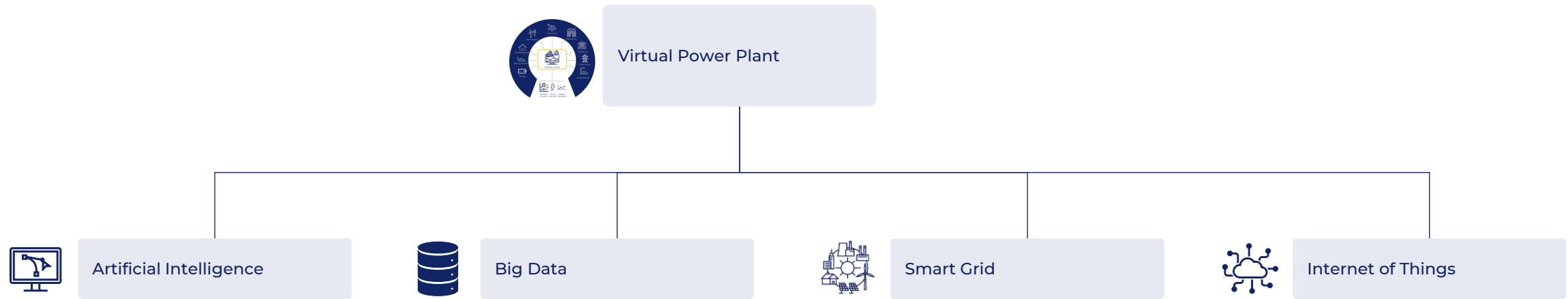


The NextEra project will create Saudi Arabia's first Virtual Power Plant, with DEMA VPP optimizing energy flow between supply and demand





Developing a virtual power plant requires deep-tech expertise in power systems, advanced modeling, AI, grid optimization, and system integration



NextEra Project Team



Power System Expert
Founder
Faris Aljehani



Project Lead
Co-Founder
Mohammed Aljehani



Chief Technology Officer
Mohammed Alshiekh



Software Director
Suliman Aljarbua

Renewable Energy Expert

Sami Alalwani
(to be hired)

Power Optimization Expert

Dr. Tawfiq Aljohani
(to be hired)

Software Engineer
(to be hired)

Software Engineer
(to be hired)

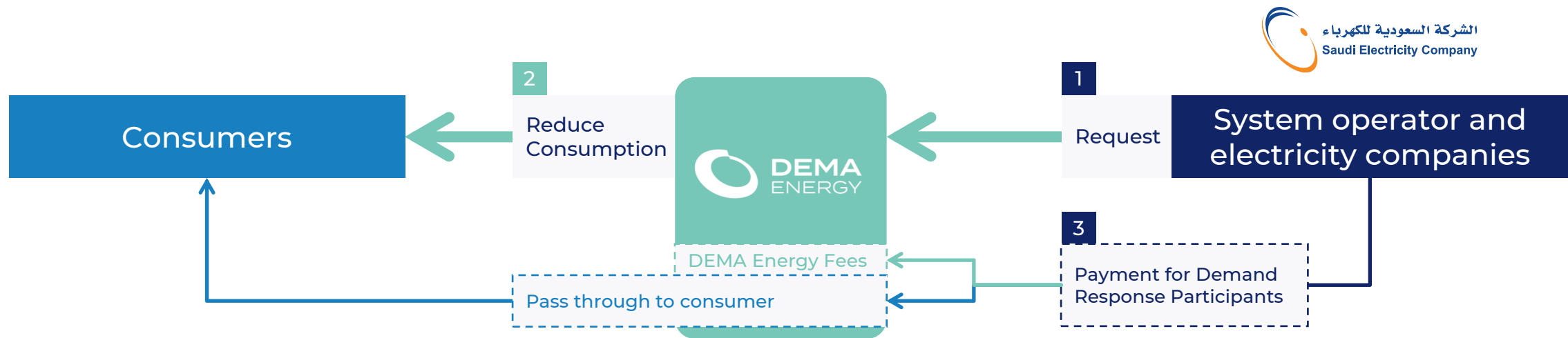
UI/UX
(to be hired)



DEMA VPP™

DEMA Virtual Power Plant™

Connects and manages energy loads across buildings, cutting costs and emissions while rewarding consumers for supporting the grid





Glimpse into the global market for virtual power plants

+60GW

Resources under management

\$ 2.1B

Market size as of 2024

26%

CAGR

\$ 14B

Revenue for the customers since 2015

















10M

Number of customers





VPP market demonstrates diverse approaches to Virtual Power Plants incorporating various resources like smart thermostats, EVs, and solar systems

Company	Location	Size	Service	Resource Type
 Renew Home	US	3 GW	Virtual Power Plant	 
 EnergyHub	Arizona, US	145 MW	Demand Response	 
 TESLA	US	100 MW	Virtual Power Plant	 
 SUNRUN	California, US	32 MW	Demand Response	 
 olivine	California, US	140 MW	Demand Response	  



DEMA's R&D efforts, recognized by RDIA for aligning with national priorities, include a partnership with KFUPM to advance sustainable energy solutions

Recognition by RDIA

شركة وطنية انطلقت في تقنياتها من
البنية التحتية البحثية بالملكة

DEMA ENERGY

حلول مرنة لطاقة مستدامة

- ✓ تتميز تقنيات الشركة بقدرة عالية على تحويل أنظمة الطاقة من الحالة المركزية إلى نظم مرنة ذات كفاءة عالية، تساهم في تقريب الموارد من المستهلكين، وتقليل التكاليف التشغيلية.
- ✓ تستفيد الشركة من البنية التحتية البحثية في المملكة، وطورت تقنياتها المتقدمة في مجال الحوسبة لتوفير حلول مستدامة لتحديات قطاع الطاقة محلياً ودولياً.
- ✓ توفر الشركة حلولاً مبتكرة لمعالجة هدر الطاقة ومراحل تخزينها وتوزيعها، وتراعي في أدائها تحقيق مستهدفات الاستدامة والحد من الانبعاثات الضارة الناتجة عن توليد الكهرباء.
- ✓ تعزز الشركة في تقنياتها من مفهوم الحوسبة الموزعة التي تمكن أنظمة الطاقة من المحافظة على كفاءتها في مختلف الظروف، وتعالج أي خلل طارئ في أوقات فورية.
- ✓ تعزز الشركة في دور قطاع الطاقة في تنمية الميزة التنافسية للمملكة، وتتيح إمكانية إحداث نقلة نوعية في تطوير تقنيات صناعة الطاقة، لتلبية الطلب المتزايد عليها.

زيارة الموقع

هيئة تنمية البحث والتطوير والابتكار
Research Development and Innovation Authority

RDIA
WWW.RDIA.GOV.SA

X Link

LinkedIn Link

Collaboration with KFUPM



جامعة الملك فهد للبترول والمعادن
King Fahd University of Petroleum & Minerals

Collaborating with KFUPM, DEMA established the DEMA Innovation Lab and signed a research and development agreement covering two areas: demand reduction and demand creation

DEMA Innovation Lab



Demand Reduction

Study the impact of adding new load profiles to the electrical grid

Demand Creation

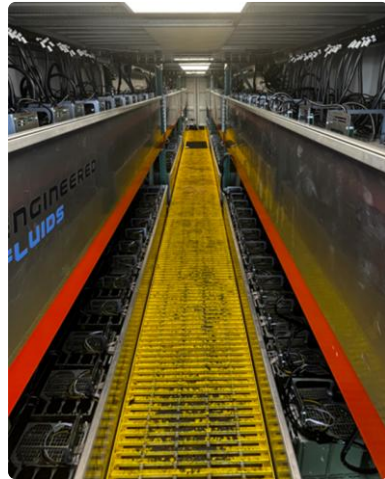
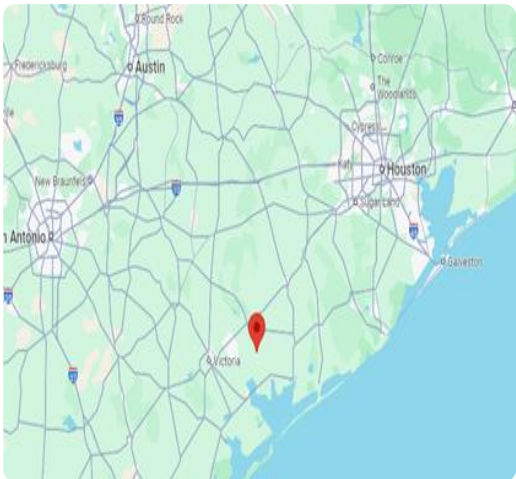
Study the effect of control and load reduction methods on the electrical grid

KFUPM Support Letter





The MVP demonstrates exceptional performance with 92% success in 1,009 demand events, reducing energy use by 90% and stabilizing quickly after grid commands



1.5 MWs
Size

Feb 2024
Operating since

System Performance

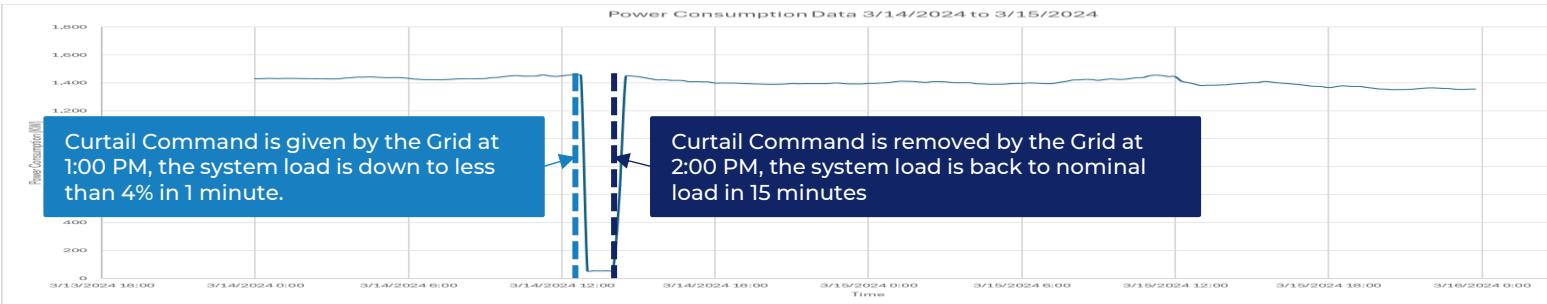
1,009

Total Demand Response Events

92%

Success Rate

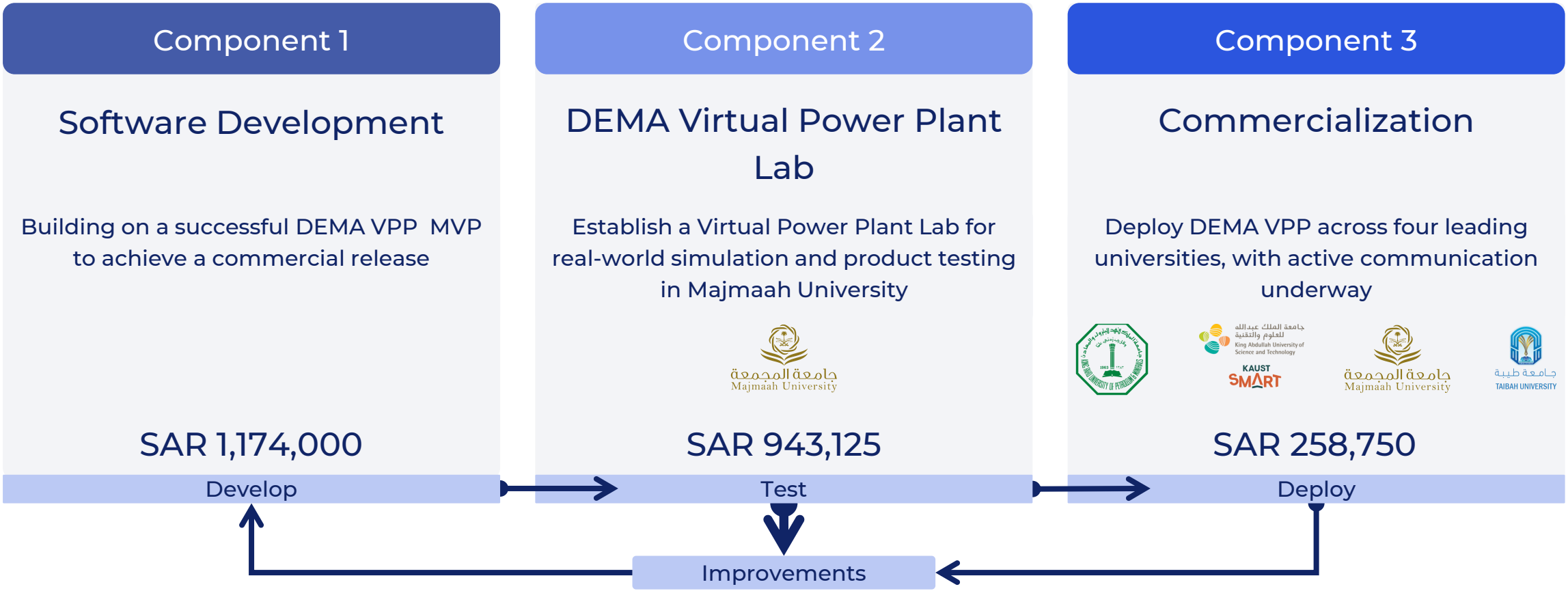
Our system responds quickly, reducing energy use by 90% and promptly returning to normal levels after the grid stabilizes





The NextEra project drives progress from development to commercialization of DEMA VPP through three key components

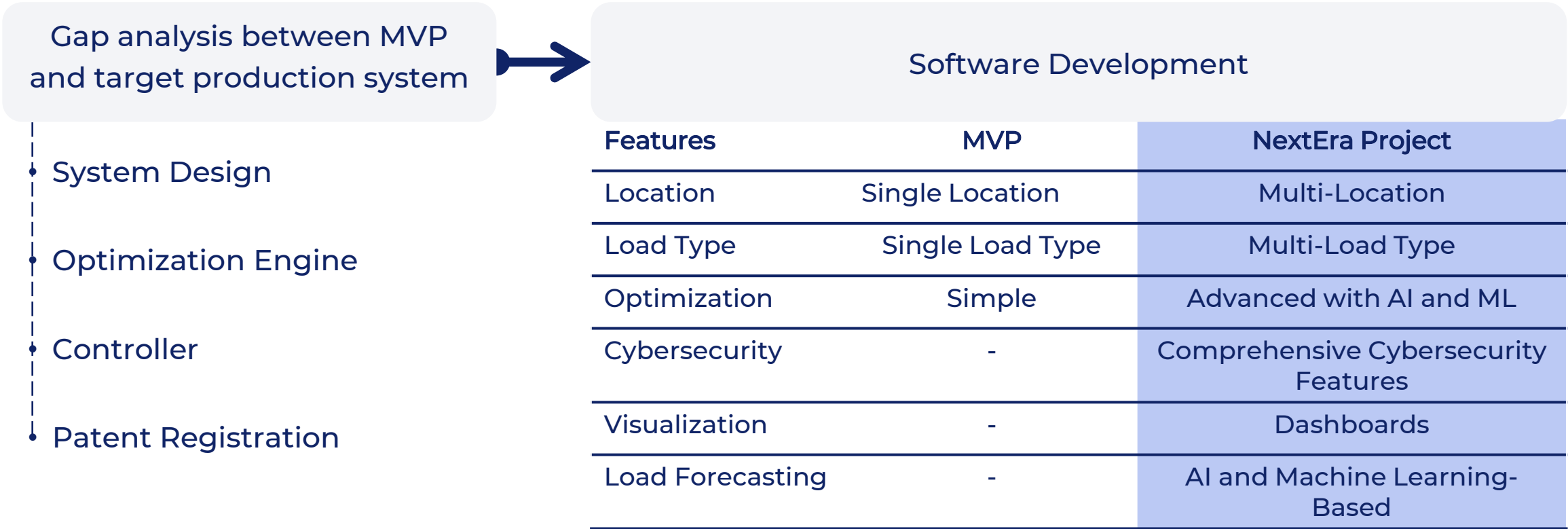
Our Project objective is to commercialize the product in Saudi Arabia part of the national 2025 Demand Response Program





Software Development

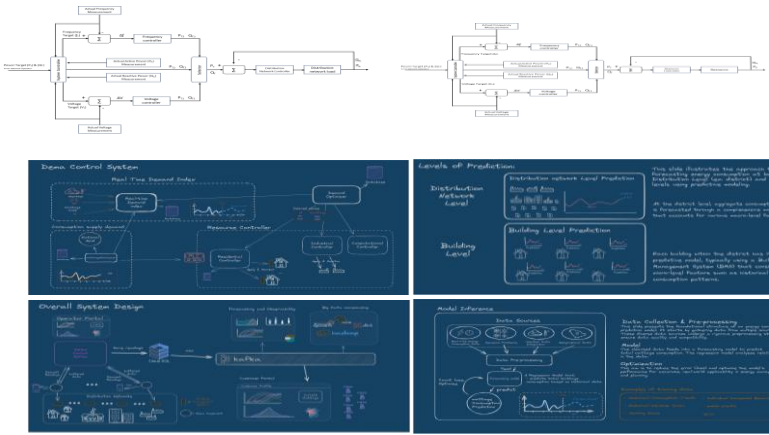
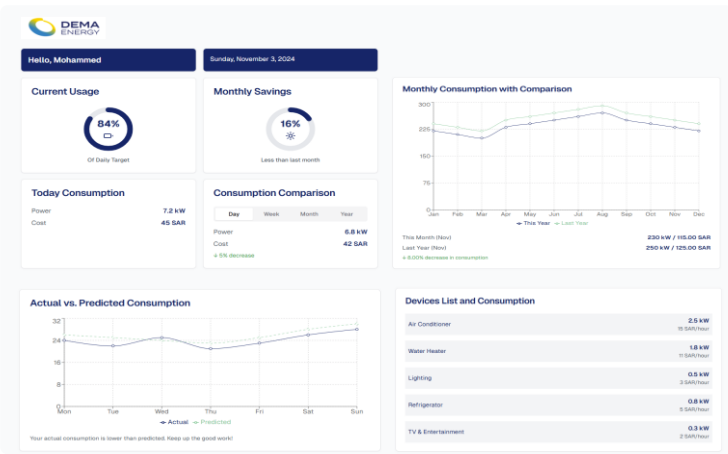
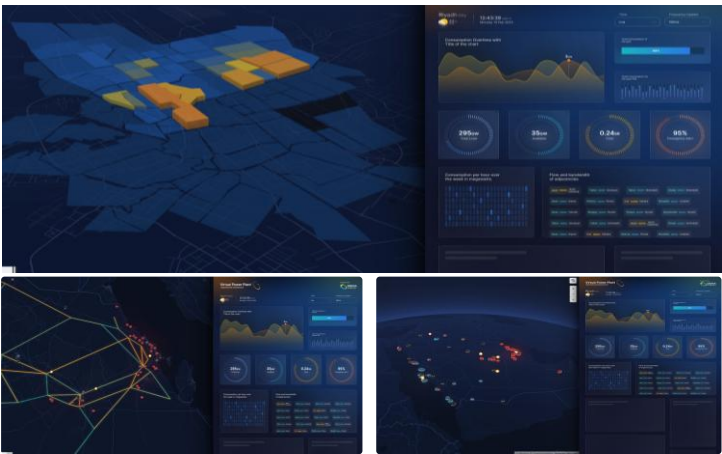
Software development begins with theoretical foundations, expanding the MVP with multi-location support, AI optimization, dashboards, and cybersecurity





Software Development

Software development begins with theoretical foundations, expanding the MVP with multi-location support, AI optimization, dashboards, and cybersecurity



Ongoing Software Development

Ongoing System Design

Milestone

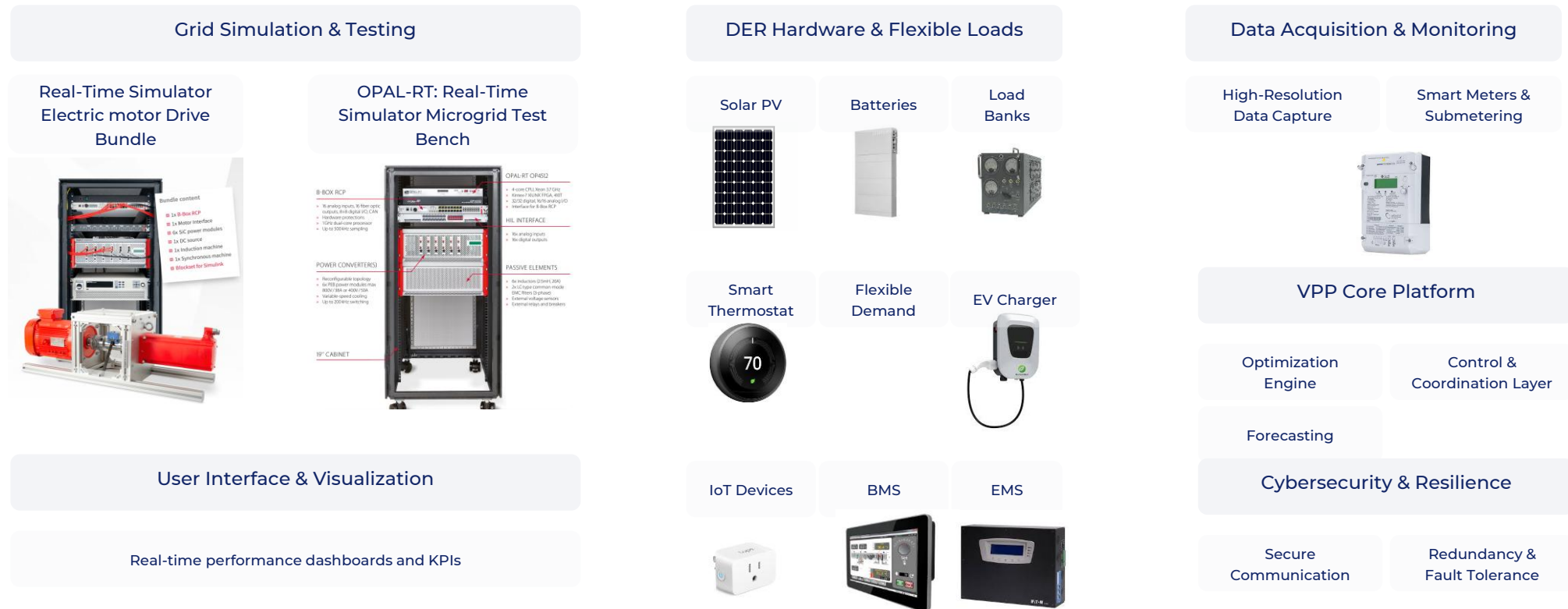
Efforts

Milestone 1: Evolution from MVP to Full-Scale VPP Development	System design has already started to move from the MVP to NextEra Version
Milestone 2: Complete DEMA VPP Lab	The list of equipment and tests plans is undergoing, including location selection
Milestone 3: DEMA VPP Software Testing in DEMA VPP Lab	We have already started building our simulated testing environment allowing smooth translation to physical lab environment when the lab is complete.
Milestone 4: Commercial Deployment	Working with 4 universities to implement the solution at different stages.
Milestone 5: Expansion in Saudi Market	We have been engaging with SEC and MoEnergy Demand side management team for a while with clear implementation plans and surveys done.



Demand-Side Management Lab

Establishing DEMA VPP Lab at Majmaah University to simulate real-world environments for continuous product development, testing, and R&D



Objective

The lab offers a platform for real-world testing of demand-side management strategies, renewable energy integration, and advanced energy market participation



MoEnergy prioritizes reducing energy demand in key regions, and DEMA VPP offers the solution to achieve this goal effectively, providing us with a clear path for growth



KAUST
SMART



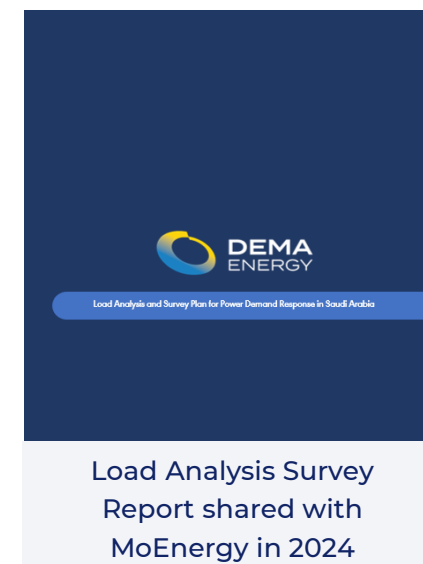
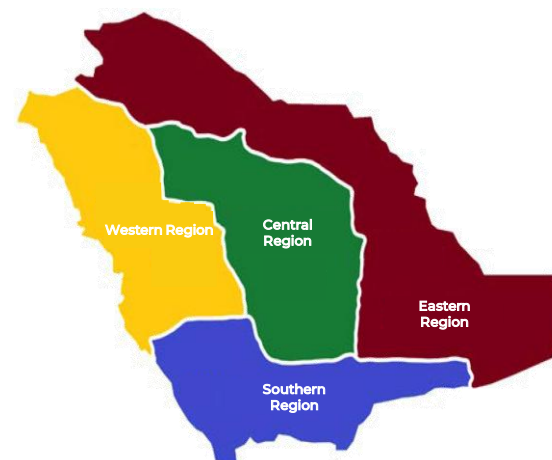
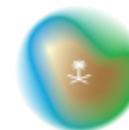
جامعة المجمعة
Majmaah University



جامعة طيبة
TAIBAH UNIVERSITY

We targeted 4 universities and initiated discussions to deploy DEMA VPP. The feedback has been positive. Universities were chosen for their substantial energy loads to manage and their capacity to support research initiatives

وزارة الطاقة
MINISTRY OF ENERGY



MoEnergy is focused on reducing energy demand in the western and southern regions, where liquid fuel, a more expensive alternative to natural gas, is predominantly used

Be part of our story



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