



Anticipation of Scientific and Technological Disruptions on Energy Mix

Case Study

Case study: Business case and solution

Anticipation of Scientific and Technological Disruptions on Energy Mix

Client	A integrated oil and gas player
Industry	Energy, Industry and Enabling Domains
Products	Technology roadmap to better anticipate technological disruptions

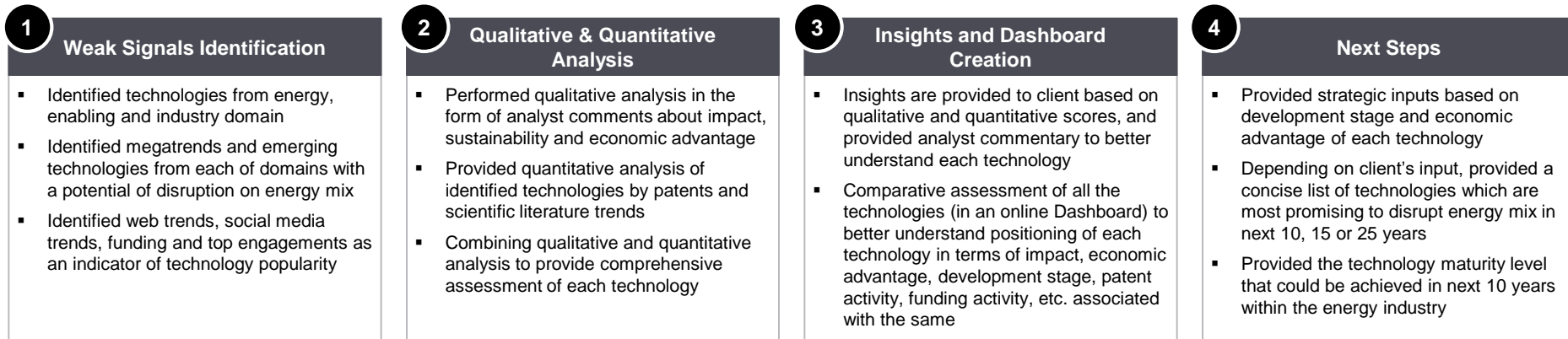
Context

- Client wanted to know disruptive technological innovations across energy, industry and enabling domain, and their impacts on energy mix for a timeframe of 10, 15 or 25 years

Key Business Questions

- What are all the technologies which have potential to disrupt energy mix in coming future?
- What are the strategies to be adopted by client w.r.t. such technologies?

Engagement Scope



Case study: Methodology and benefits to client

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Research Methodology

Secondary Research

- Conducted desk research to identify all the megatrends and emerging technologies with potential disruptive impact on energy mix
- Referred scientific literatures and news for latest updates on each technology from different domains

Primary Research

- Interacted with industry experts to confirm impact analysis conducted by FutureBridge for each technology

Benefits to Client

- Helped client in anticipating and understanding potentially disruptive technologies from energy, industry and enabling domains
- Provided strategic inputs through a focused on-site workshop about how to proceed regarding such high impact technologies

Sample Analysis

1 Weak Signals Identification

Concept	Impact	Category	Subcategory
Artificial intelligence	High	AI	AI
Autonomous vehicles	High	Transportation	Transportation
3D printing	Medium	Manufacturing	Manufacturing
Biotechnology	High	Biotech	Biotech
Space exploration	Medium	Space	Space
Quantum computing	High	Computing	Computing
Virtual reality	Medium	VR/AR	VR/AR
Blockchain	Medium	Blockchain	Blockchain
Cloud computing	High	Cloud	Cloud
Big data	High	Data	Data
Internet of Things (IoT)	High	IoT	IoT
Wearable devices	Medium	Wearables	Wearables
Smart homes	Medium	Smart Homes	Smart Homes
Smart cities	High	Smart Cities	Smart Cities
Smart grids	High	Smart Grids	Smart Grids
Smart meters	High	Smart Meters	Smart Meters
Smart buildings	Medium	Smart Buildings	Smart Buildings
Smart agriculture	Medium	Smart Agriculture	Smart Agriculture
Smart manufacturing	High	Smart Manufacturing	Smart Manufacturing
Smart transportation	High	Smart Transportation	Smart Transportation
Smart energy	High	Smart Energy	Smart Energy
Smart infrastructure	High	Smart Infrastructure	Smart Infrastructure
Smart services	High	Smart Services	Smart Services
Smart retail	Medium	Smart Retail	Smart Retail
Smart education	Medium	Smart Education	Smart Education
Smart healthcare	High	Smart Healthcare	Smart Healthcare
Smart entertainment	Medium	Smart Entertainment	Smart Entertainment
Smart security	High	Smart Security	Smart Security
Smart defense	High	Smart Defense	Smart Defense
Smart space	High	Smart Space	Smart Space
Smart ocean	High	Smart Ocean	Smart Ocean
Smart atmosphere	High	Smart Atmosphere	Smart Atmosphere
Smart geosphere	High	Smart Geosphere	Smart Geosphere
Smart biosphere	High	Smart Biosphere	Smart Biosphere
Smart lithosphere	High	Smart Lithosphere	Smart Lithosphere
Smart hydrosphere	High	Smart Hydrosphere	Smart Hydrosphere
Smart atmosphere	High	Smart Atmosphere	Smart Atmosphere
Smart geosphere	High	Smart Geosphere	Smart Geosphere
Smart biosphere	High	Smart Biosphere	Smart Biosphere
Smart lithosphere	High	Smart Lithosphere	Smart Lithosphere
Smart hydrosphere	High	Smart Hydrosphere	Smart Hydrosphere

2 Qualitative & Quantitative Analysis

Technology	Impact	Probability	Score
Artificial intelligence	High	High	12
Autonomous vehicles	High	High	9
3D printing	Medium	Medium	7
Biotechnology	High	High	8
Space exploration	Medium	Medium	5
Quantum computing	High	High	8
Virtual reality	Medium	Medium	4
Blockchain	Medium	Medium	4
Cloud computing	High	High	4
Big data	High	High	4
Internet of Things (IoT)	High	High	4
Wearable devices	Medium	Medium	4
Smart homes	Medium	Medium	4
Smart cities	High	High	4
Smart grids	High	High	4
Smart meters	High	High	4
Smart buildings	Medium	Medium	4
Smart agriculture	Medium	Medium	4
Smart manufacturing	High	High	4
Smart transportation	High	High	4
Smart energy	High	High	4
Smart infrastructure	High	High	4
Smart services	High	High	4
Smart retail	Medium	Medium	4
Smart education	Medium	Medium	4
Smart healthcare	High	High	4
Smart entertainment	Medium	Medium	4
Smart security	High	High	4
Smart defense	High	High	4
Smart space	High	High	4
Smart ocean	High	High	4
Smart atmosphere	High	High	4
Smart geosphere	High	High	4
Smart biosphere	High	High	4
Smart lithosphere	High	High	4
Smart hydrosphere	High	High	4

3 Insights and Dashboard Creation

Visualization of technologies from a client's perspective would be done for impact potential and drivers (social/market)

TIL evolution trends would be evaluated based on impact on the energy domain

Energy category: High potential (HPIOT), High probability of occurrence (HPO), Low potential (LPIOT), Low probability of occurrence (LPO)

Market drivers: Sustainability, Innovation, Market drivers, Market drivers

Impact: High impact on energy mix, Low impact on energy mix

4 Next Steps

High potential (HPIOT), High probability of occurrence (HPO), Low potential (LPIOT), Low probability of occurrence (LPO)

Involvement versus the impact it could have on the energy mix

Low involvement, High involvement

Low impact, High impact

Leader, Smart User, Follower

Probability of Occurrence

Core Research, Core Research, Core Research, Core Research

Thank you

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