

# **World Energy Scenarios**

ALTERNATIVE PATHWAYS  
FOR MEXICO TO 2030:  
EXPLORING BUSINESS  
MODEL INNOVATION

White Paper: Executive Summary

**IN COLLABORATION WITH  
ACCENTURE STRATEGY**

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# WORLD ENERGY SCENARIOS: AN ENABLING FRAMEWORK FOR BUSINESS MODEL INNOVATION

**Energy systems are being transformed** by an accelerating pace of new technology developments and an interplay with wider societal, geopolitical and environmental changes. The Grand Transition is underway.

**It is not possible to predict the new energy future.** In 2016, the Council published a set of three World Energy Scenarios describing alternative and plausible energy transition pathways to 2060. Each scenario foresees a different world energy mix system and global energy mix and explores what this means for regional and national energy ecosystems. These scenarios define what might happen, rather than what should or will happen.

**Leadership attention to business model innovation is growing.** Many individual firms, especially major oil and gas companies and power utilities are already looking at the combination of renewables and digitalisation in accelerating the potential obsolescence of traditional core models, which focus on physical integration, economies of scale and access simplicity. New players from beyond the energy system are also exploring opportunities in generation, distribution and value-adding services.

**The World Energy Scenarios to 2060 provide a clear, enabling framework for addressing strategic questions about business model innovation in the Grand Transition:** What are the vulnerabilities of existing energy business models? How can the future success of emerging business models be evaluated? How can better energy business models be enabled?

**The advantage of using the World Energy Scenarios is three-fold:**

- **Neutral and global perspectives** – the scenarios offer a resource- and technology-neutral perspective of development of the world energy system and harness a wealth of energy expertise from the Council members in almost 100 countries;
- **Deeper understanding of new energy ecosystems** – the scenarios offer new insights about the interplay of technological and non-technological drivers of innovation and the shifts in producer-consumer relationships that are transforming energy markets;
- **A leadership platform for energy governance** – the scenarios provide a platform for leadership discussions about new social value creation, shifting competition and emerging policy risks associated with new global and ultra-local energy business models.

The unique benefits of using the World Energy Scenarios as an enabling framework to better understand business model innovation has been demonstrated through application in Mexico case.

## SUMMARY OF KEY MESSAGES

- **New energy business models are rapidly emerging from within and beyond the energy sector.** New models include the recombination of existing models, the emergence of new global, and ultra-local models, and the extension of the traditional energy market boundary into value-added services (e.g. green power, e-mobility, etc.)
- **Energy leaders need to build hyper-relevant business models** to sustain social and economic value, generate profit and enable progressive competitiveness. The future success of existing and new business models can be evaluated using World Energy Scenarios.
- **Disruptive business models emerge quickly and grow exponentially if the right conditions are met.** This disruption threatens to hinder the operation and performance of current business models. Therefore, stakeholders need to be able to identify critical trends and translate them into strategies to mitigate future risks
- **Accelerating pace of new technology developments and non-technologies drivers are rapidly transforming some energy sectors.** Digitalisation and renewables are important disruptors, but not the only drivers, of energy business model innovation. Non-technological drivers include societal preferences, energy market policy regime and non-energy policies.
- **Business models disruption impacts existing firms and wider energy stakeholders.** Energy industry players, investors, regulators and governments need to cooperate and prepare a critical path that enables whole societies to flourish under the Grand Transition.
- **Government policies can play a key role in energy system evolution** via enabling and steering business model innovation in a way that is: i) technologically neutral, and ii) by attending to emerging risks of more global and ultra-local energy business models using a suitable evaluation framework that reflects clear, long term objectives.
- **An increasing variety of new and multi-dimensional frameworks are available to evaluate business model innovation** and its role in promoting the sustainable supply and use of energy for the greatest benefit of all people.

## MEXICO CASE: SPECIFIC HIGHLIGHTS

Stakeholders can leverage the key findings of the Mexico case study to create solid mid-term strategies to face the future challenges within the energy industry.

- **The success of business models will be determined by the local endowment and the evolution of global and local energy systems.** Future policies, consumers' behaviour and technology evolution will foster the adoption of specific business models at a global level. These business models will only thrive in a region or country if local resources and partners are available.
- **Energy Reform in Mexico offers the flexibility to adapt to different scenarios.** Being able to shift towards any of the three scenarios, allows the local energy sector to embrace global trends and mitigate risks. The current transformation is an unparalleled opportunity for the government, regulatory entities and private companies to adapt and thrive within the energy industry.
- **Business models fostering Environmental Sustainability were found relevant in all Mexican scenarios.** Technology-driven environmental business models would increase their economic viability in Modern Jazz. Energy efficiency and adoption of clean energy solutions are the focus of Unfinished Symphony. Renewable energy business models contribute towards energy security making them relevant under a Hard Rock scenario.
- **At least 3 of the 26 new and emerging energy business models evaluated in the Mexico case were found to be highly relevant in all three scenarios:** (i) 'Energy intelligence provider'; (ii) 'Platform that provides potential power generation forecasts from renewables'; and, (iii) 'Platform to connect renewable energy players to accelerate development'.
- **The government may play a key role in orienting segments and stakeholders of the energy value chain to become innovators or followers.** The Mexican energy industry is currently being shaped by governmental reforms to define the primary energy mix, the key infrastructure investment plans, and the degree of private participation along the value chain. Therefore, the government has the responsibility to foster the innovation and enable implementation of business models, and choose to facilitate the adoption business models developed outside the country.

**New questions** concerning how governments, regulatory entities and private companies should prepare for the Grand Transition have been identified and could be relevant for other regions, including:

- Which trends from other industries could be incorporated to the energy sector?
- Which investments in infrastructure and resources should be prioritised to prepare for the implementation of emerging business models?
- In which segments of the value chain should governments increase investment for the development of innovative technologies and identification of new operating models?

# GRAND TRANSITION

## PERSPECTIVES World Energy Scenarios

### Mexican Energy Scenarios



MODERN JAZZ

#### DESCRIPTION

Mexico would foster an open and competitive market to achieve accessible energy through a rapid deployment of new technologies and business models



UNFINISHED SYMPHONY

#### DESCRIPTION

Mexico would adopt stronger policies focused on environmental sustainability maintaining its position as a leader among developing countries



HARD ROCK

#### DESCRIPTION

Mexico would seek to diversify source of imports, increase local energy supply, and support solutions based on the national capabilities

In each scenario, local stakeholders would have different priorities along the Energy Trilemma, implying distinct expected actions from policy makers and private companies.



Energy Equity



Environmental Sustainability



Energy Security

# EXPECTED ACTIONS



MODERN JAZZ



UNFINISHED SYMPHONY



HARD ROCK

## GOVERNMENT AND AGENCIES

- |                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Increase regulatory efficiency</li> <li>• Reduce monopolistic power of incumbents in key segments of the value chain</li> <li>• Continue with bidding rounds</li> <li>• Optimise grid transmission</li> </ul> | <ul style="list-style-type: none"> <li>• Implement strict regulation to monitor environmental compliance</li> <li>• Provide incentives to lower carbon emissions and adopt renewable energy solutions</li> <li>• Decrease frequency of bidding rounds</li> </ul> | <ul style="list-style-type: none"> <li>• Offer financial support to develop non-traditional resources</li> <li>• Increase on the frequency of bidding rounds</li> <li>• Foster efficient resolution of social/security issues</li> </ul> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## HYDROCARBONS SECTOR

- |                                                                                                                                                                                                       |                                                                                                                                                                                |                                                                                                                             |
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| <ul style="list-style-type: none"> <li>• Optimise the use of associated gas</li> <li>• Develop unconventional gas to match demand</li> <li>• Adopt new technologies to increase efficiency</li> </ul> | <ul style="list-style-type: none"> <li>• Slow down market openness</li> <li>• Increase taxes on fossil energies</li> <li>• Raise quality standards for liquid fuels</li> </ul> | <ul style="list-style-type: none"> <li>• Diversify sources of import</li> <li>• Develop unconventional resources</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|

## POWER SECTOR

- |                                                                                                                                                                                                                           |                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Modernise transmission grid</li> <li>• Investment on new generation and distributed generation projects</li> <li>• Adopt co-generation and renewable energy solutions</li> </ul> | <ul style="list-style-type: none"> <li>• Increase efforts for carbon emissions reduction</li> <li>• Increase investment in renewables and distributed energy</li> <li>• Incentivise for the adoption of sustainable technologies</li> </ul> | <ul style="list-style-type: none"> <li>• Slow down of the decommissioning of carbon intensive generation</li> <li>• Focus on energy security measures over carbon emission reduction</li> <li>• Adopt of self-generation solutions to improve energy sufficiency</li> </ul> |
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## EXAMPLES OF RELEVANT BUSINESS MODELS IN EACH SCENARIO

*“Gas to wire model in gas field areas with shortage of gas pipelines”*

Brings a solution for areas of oil production with a lack of gas transport infrastructure. The rapid technology development and the focus on increasing energy access would make this model economically viable.

*“Smart house from brick to appliance”*

Allows energy conscious consumers to make smarter decisions when building or remodelling. Government may support this business model through fiscal incentives to achieve energy efficiency goals.

*“Platform to connect O&G industry players to accelerate development”*

Facilitates demand fulfilment through integrating information from multiple companies offering services or products. It contributes to Energy Security by efficiently developing local resources at an accelerated pace.

## EMERGING BUSINESS MODELS

31 new and emerging energy business models were identified as relevant at a global level and 26 were further assessed within the Mexican context. Business models were evaluated using the Energy Trilemma framework that reflects the Energy Reform in Mexico. The potential to enhance the convenience of use and the improvement of quality of life for final consumers is a powerful driver for innovation in every sector and was also assessed in the initial review under a category of evaluation denominated Energy Plus.

This sample of business models is by no means exhaustive but intends to illustrate main implications and challenges that alternative future of the energy system would entail globally and for Mexico.

### LIST OF BUSINESS MODELS CLUSTERED BY ENERGY TRILEMMA AND ENERGY PLUS ELEMENTS

- Oil and Gas
- Electricity
- Both
- Technology driven
- New business model
- \*\* Lowest relevance for Mexico





## THE WAY FORWARD

The Mexico case study is a starting point in developing conceptual framework to explore business model innovation which can be suitable for use in other Latin America and the Caribbean countries or world regions.

The methodology can be customised through choice of an appropriate organising framework and directed to testing the vulnerabilities of existing models as well as designing new energy business models.

The way forward in developing business model innovation approach include following steps:

- Creating the “**library of new and emerging business models**” through continues scenarios application and stakeholders’ engagement
- Promoting wider application of scenarios for **testing** vulnerabilities to existing business models, **evaluating** of new and emerging business models and **designing** “fitter” business models,
- Encouraging the development of a **new case studies** to assess the relevance and the ease of implementation of new and emerging energy business models within another country or region,
- Refining methodology, complementing and **strengthening the future narrative** based cases with additional quantitative analysis and energy modelling,
- Developing **evaluation toolkit** for better use of business model innovation to engage with diverse stakeholders and creating the culture for the use of scenarios,
- Strengthening the **platform for stakeholder’ collaboration** to encourage an open and independent dialogue to address policy and social risks.

## ABOUT THIS WHITE PAPER

This White Paper describes a new work stream within the Council, using the World Energy Scenarios to explore the role of business model innovation in promoting the sustainable use of energy for all.

White Papers are a new series of working papers developed by the Council. They facilitate strategic sharing of knowledge between the Council members and other energy stakeholders and policy shapers in a fast-paced era of disruptive change. The views expressed serve as basis for discussion and to inform the Council's strategic and perspective studies along with events and our members.

The papers are developed by the Council in collaboration with a project partner and do not reflect the opinion of the global Council's network.

If you would like to receive a full copy of this White Paper, or to explore how you can use scenarios to better understand business model innovation, please contact [scenarios@worldenergy.org](mailto:scenarios@worldenergy.org)

## **WORLD ENERGY COUNCIL**

The World Energy Council is the principal impartial network of energy leaders and practitioners promoting an affordable, stable and environmentally sensitive energy system for the greatest benefit of all.

Formed in 1923, the Council is the UN-accredited global energy body, representing the entire energy spectrum, with over 3,000 member organisations in over 90 countries, drawn from governments, private and state corporations, academia, NGOs and energy stakeholders.

We inform global, regional and national energy strategies by hosting high-level events including the World Energy Congress and publishing authoritative studies, and work through our extensive member network to facilitate the world's energy policy dialogue.

### **World Energy Council's Flagship Publications**

- World Energy Scenarios 2016
- World Energy Trilemma 2016
- World Energy Trilemma Index 2016
- World Energy Resources 2016
- World Energy Issues Monitor 2017

### **Upcoming World Energy Leaders' Summit**

- Lisbon, Portugal, 18-19 October 2017

Further details at [www.worldenergy.org](http://www.worldenergy.org) and [@WECouncil](https://twitter.com/WECouncil)

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