

World Energy Council Study Group on World Energy Scenarios

Terms of Reference 2013-2016

1. Introduction

Following the well-received launch of its most recent set of world scenarios, “World Energy Scenarios: Composing Energy Futures to 2050”, in October 2013, the World Energy Council (WEC) is now launching the next round of its scenario activities.

2. Objectives of WEC scenarios activities

The overarching aim of the WEC scenarios effort is to ensure that its world energy scenarios are the leading, most independently informed and most oft quoted source of scenarios in the energy field.

Complementary objectives are to:

- a. **Service broad WEC membership needs:** that is, the ability to address themes of regional interest, with global relevance.
- b. **Develop partnerships and sponsorships:** which implies, the ability to address issues of strategic interest to key partners and potential sponsors.
- c. **Ensure that WEC’s scenarios and model are used** by third parties, be they members, partners, sponsors, or governments.

The WEC’s Scenarios Study Group will pursue the above objectives in order to ensure that the scenarios have the highest benefit to WEC’s members and other interested parties.

3. Work Programme 2014-2016

The WEC core team undertaking scenario activities consists of a Scenarios Executive, the Scenarios Study Group, and a modelling partner, the Paul Scherer Institute (PSI).

As outlined in Annex A the team will undertake two regional scenario projects (Latin America and Africa) and produce a new set of world energy scenarios for the World Congress in 2016. Additional projects will be considered if sufficient interest and funding are available.

In developing scenarios the core team will examine the following themes, which provide partial guidance to the forthcoming work programme:

- a. **Theme 1**, aligned with interests in Latin America (EA/WELS 2014) and Africa (EA/WELS 2015): **energy-water-food (EWF) nexus, with special focus on bioenergy and hydro, and energy access.** Evaluation of the potentials of bioenergy and hydro; assessing opportunities/limitations with regards to these potentials; assessing the relevant aspects of the EWF

nexus with specific focus on the region(s). and refining the WEC/PSI energy model capabilities with regards to the EWF nexus;

- b. **Theme 2**, aligned with interests in Asia, notably: **urbanisation, e-mobility and the system defining role of e-storage**. This is also of interest outside the region, for example, by Hydro-Quebec (e-mobility) and Aramco (e-storage). There is wide interest in a deep-dive into e-storage innovation potential and the potential system changing character of any substantive break-through; assessing potential implications for e-mobility, and effects on electricity versus liquid fuels demand; assessing the opportunities/limitations with regards to these potentials. This would include assessing the regional implications of shifting technology and demand patterns; refinement of the WEC/PSI model to handle innovation in e-storage, e-mobility and consequent system implications. (A possible alternate regional focus of this theme could be EU/Russia.)
- c. **Theme 3**, with an eye on the Istanbul Congress theme (2016) which, on a preliminary basis, could be **'redefining resilience of energy infrastructure'** against both old and new risks including, for example, extreme weather events, cyber-attacks, and accelerating EWF nexus dangers. This would require identifying a set of key risks which define the new requirements for energy infrastructure, as well as potential responses to improve infrastructure resilience; studying regional potentials of identified risks and of responses; assessing opportunities/limitations with regards to these potentials; and refining the WEC/PSI model capabilities with regards to the handling of risks and system implications of related innovations.

The above three themes would provide a phased build up towards the production of world energy scenarios, with a 2060 time frame, for the 2016 Congress. This development is outlined in Annex A. and a summary outline of WEC scenario development from 2014 until 2016 is shown in Annex B.

4. Methodology and Modus Operandi

The Scenarios core team will continue to use data and information obtained from the WEC membership network, expert international organisations and other sources, e.g. dedicated project partners. Also other WEC databases and knowledge networks will be used as required. It is envisaged to work closely with other WEC flagships, such as the World Energy Resources and the World Energy Trilemma work to **ensure greater consistency across WEC work** streams.

In order to provide quantification of the scenario stories, WEC will pursue the concept of an 'open source model'; that is using a web-accessible global energy model, which can be used by third parties such as companies, governments, and experts. This aspiration will be shaped by available resources and feasibility of employing such an approach.

The Study Group will meet 4-6 times per year, physically and/or virtually.

5. Roles and Responsibilities

There are two key bodies that participate in the development of the World Energy Scenarios report 1) the Study Group and 2) the Project Team. Several other WEC groups support the work.

a. The Study Group:

- i. The Study Group consists of approximately 30 Member Committee representatives, an Executive Chair and the Project Team.
- ii. Study Group members commit to regular, prepared participation in meetings.
- iii. The Study Group will provide overall guidance and input to the Project Team and give project support where appropriate (e.g. contribute country examples and short summaries).
- iv. At key report milestones, the Study Group members provide feedback on key conclusions, recommendations, messages, and draft reports.
- v. Study Group members agree to support outreach activities to own stakeholders / network where possible.
- vi. Study Group members will be recognized for their support in the final report.

b. The Project Team:

- i. The Project Team consists of the WEC Secretary General and WEC Studies Committee Chair (ex officio), the Director of Studies, the World Energy Scenarios Executive Chair and the Project Director / Manager as well as 2-3 team members from project partners.
- ii. The Project Team is responsible for conducting the research, subsequent analysis, and preparing various versions of the report leading to the final version.
- iii. The Project Team will provide information on meetings as well as supporting material in a timely fashion.
- iv. The Project Team may call upon other groups within WEC such as other WEC flagships and WEC Knowledge Networks, WEC Standing Committees and other experts to provide feedback and guidance in their area of expertise on the work and its conclusions, and to ensure conclusions are consistent with or shapes the WEC position on the specific subject matter.
- v. The Project Team will engage the WEC Communications Team in the process, and jointly plan and prepare the release of the reports.
- vi. Project Team members will be recognized in the final report.

c. The Executive Chair:

- i. The Executive Chair serves as the preferred public spokesperson of the World Energy Council's scenarios.

- ii. As the interface between the Studies Committee Chair and the Study Group, the Executive Chair will lead the work of the Study Group within the bounds of the Terms of Reference and is responsible to the Studies Committee Chair for ensuring that the work is completed on time, meets the expectations of the Studies Committee, ensures an optimal and balanced participation from WEC regions and across energy sectors, is technically robust and credible, is reflective of the work done by the Study Group and is consistent with or shapes the WEC position on the specific subject matter.
- iii. The Executive Chair facilitates meetings, considering various cultures and backgrounds and achieving consensus.
- iv. The Executive Chair will be recognized in the final report and has the opportunity to provide a foreword to the World Energy Scenarios report.

6. Deliverables

During 2014 the WEC scenarios project team will conduct scenario presentations of the current global scenarios results, hold regional workshops and expert meetings on topics of special interest. Every effort will be made to encourage broad use of the scenarios by members, governments and others.

This will be followed by a period of analysis and regional scenario building, with initial focus on producing Latin American energy scenarios for presentation at the Executive Assembly in Cartagena in October 2014. The final deliverable for 2014 will be in the form of a new energy scenario publication based on the existing energy model with a clear regional and thematic focus.

Additionally, input from regional workshops will be used to challenge and assess the validity of the current scenario stories (Jazz and Symphony), and if needed provide the basis for a realignment of the scenario quantification with modified scenario narratives.

Activities for 2015 and 2016 will be planned in line with the scope of work identified in Annex A, with room for changes and amendments if needed.

7. Team Resources

The Scenarios Executive consists of two full time staff members in London (a Project Manager reporting into the Deputy Director, Scenarios), supplemented by 6-8 regional members, a Senior Director and an Executive Chair, Scenarios.

8. Project Partners

WEC is committed to continue the successful cooperation on energy modelling with its project partner, PSI in Switzerland, and is in discussion with industrial partners, research institutions and member committees to obtain additional resources, both funding and secondees, for the scenario processes.

Annex A: Early draft schedule for WEC scenarios activities

Overall Vision: “To develop WEC to become the leading, most independently informed and most oft-quoted source of scenarios in the energy field.” In line with WEC’s overall mission of: “promoting an affordable, stable and environmentally sensitive energy system for the greatest benefit of all.”

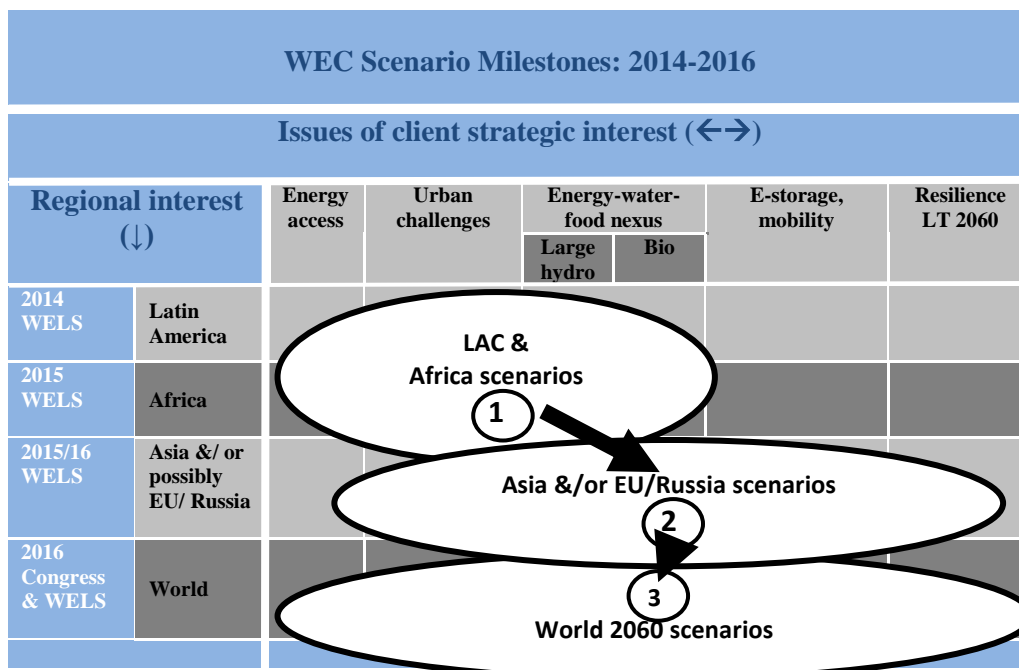
Schedule for illustrative purposes and subject to approval from WEC governance:

| Year | Synergy rationale | Possible scenario activity |
|---------|---|---|
| 2014 | <ul style="list-style-type: none"> Executive Assembly in Cartagena, Colombia New Latin American Regional Manager; strong Regional Vice Chair; Enel seconding scenarios project manager to WEC, with interest in scenarios (tbc) Interest in getting Petrobras & Eletrobras deeper involved; possibly CAF and IADB Interest in further strengthening Latin American MCs | Latin America regional deep-dive ready for the EA/WELS |
| 2015 | <ul style="list-style-type: none"> Executive Assembly in Ethiopia (President is President of African Union) Studies Chair South African; Africa Regional Manager in place; new regional Vice Chair Interest in getting Corporates deeper involved; opportunity to deepen relationship with Eskom (is Patron); possibly ADB Possibly of interest to UN SE4All follow up process Interest in further strengthening African MCs | Africa regional deep-dive ready for the EA/WELS |
| 2015/16 | <ul style="list-style-type: none"> Possible WELS co-hosted with Asian Development Bank Possible WELS in St Petersburg | Possible Asia and/or Europe/Russia regional deep-dive for the WELS (subject to available funding) |
| 2016 | <ul style="list-style-type: none"> World Energy Congress & Executive Assembly in Turkey | New global scenarios launched at Congress, 2060 time frame |

Additional signals received, for potential further deep-dives:

- Electric vehicles/storage: subject to specific company support
- A North American deep-dive exploring radical change in the regional energy landscape

Annex B: Summary outline of WEC scenario development



London, December, 2013