

Renewable Reserves Initiative Workshop

Overview and introductions

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Session 1
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Why we are here

To introduce, discuss and plan the Renewable Reserves Initiative: a new concept to quantify renewable energy, using the principles of reserves assessment

Objectives

- 1 • Provide sufficient background information about reserves and renewables
- 2 • Explain the approach used to assess oil & gas reserves
- 3 • Establish if and how this could be applied to renewable energy
- 4 • Identify the issues to be resolved to make it work
- 5 • Agree the actions required to establish an industry-wide methodology
- 6 • Secure in principle commitment from participants to support the actions

The workshop

- Not a conference or seminar – interaction vital
- Different levels of understanding in the room – need to clarify basics
- Some sessions as one group, some in smaller groups - find where you can add most value
- We will be asking for commitments of support – we realise these may have to be ‘in principle’, but please be as supportive as possible
- Important context - UN Economic Commission for Europe
 - This is not a formal project of the UNECE, but it has been presented in outline in Geneva
 - Intent of the initiative is to seek UNECE endorsement for a methodology
 - For now this is an cross-sectoral initiative



The Renewable Reserves Initiative

- **What it is**

- An initiative to create a methodology for assessing and measuring renewables alongside hydrocarbons
- Multi-stakeholder, multi-industry
- Development of an existing UNECE endorsed methodology for hydrocarbons and minerals

- **What it is not**

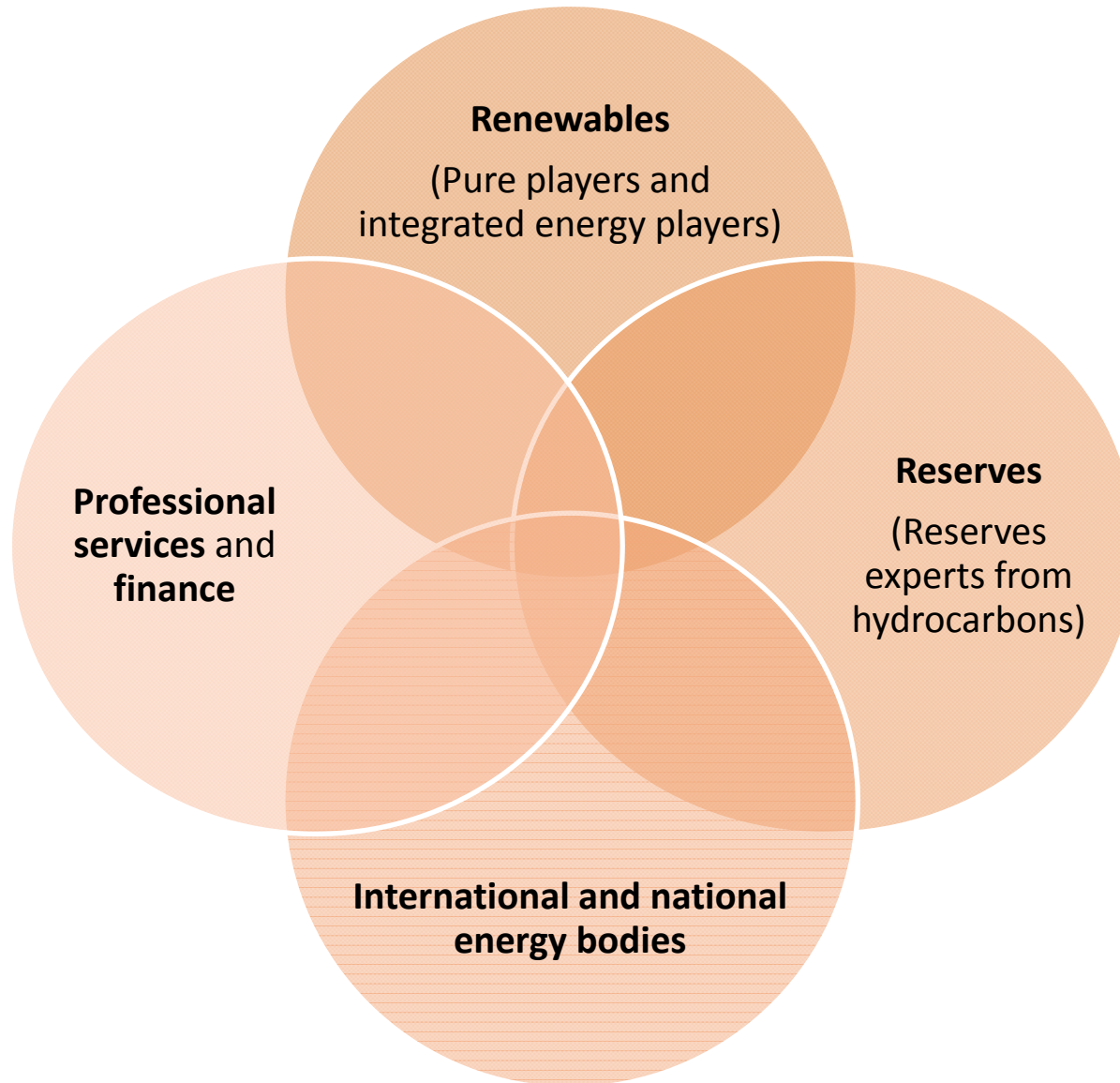
- A 'done deal'
- The property of a single owner
- A means to advocate the benefits of renewables
- A policy initiative
- A way to fit renewables into a hydrocarbon framework

The next 2 days



- What are reserves and resources?
- How are reserves measured and classified?
- What is the UNFC? How does it compare with other classifications?
- What are renewables? What is their potential? How are they measured today?
- Why should we measure renewable reserves?
- How to apply a reserves methodology to renewables?
- Case studies: biofuels, nuclear
- How would this work in my sector?
- How to develop the methodology?
- How can we make this initiative successful?
- What are the next steps?
- Who does what, by when?

A unique combination of expertise



Renewable Reserves Kick-off Workshop

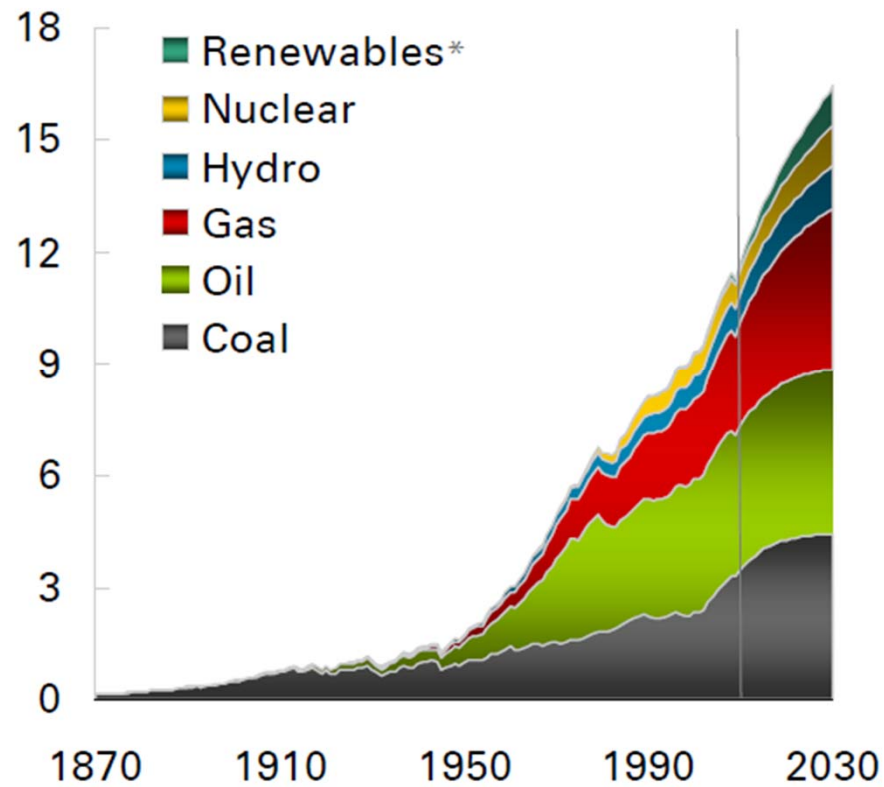
London – October 31st / November 1st



Why now?

World Commercial Energy Use

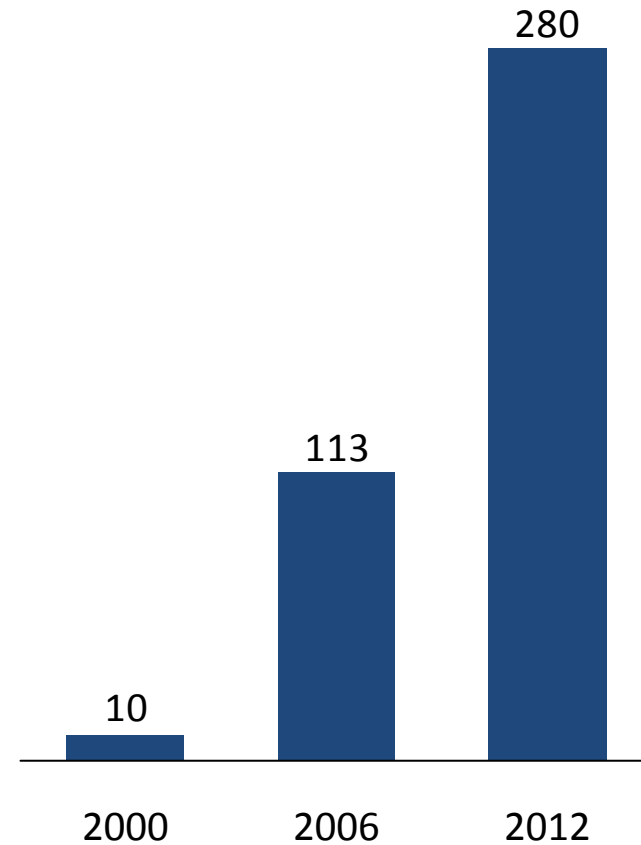
Billion toe



* Includes biofuels

Global Investment in RE ¹

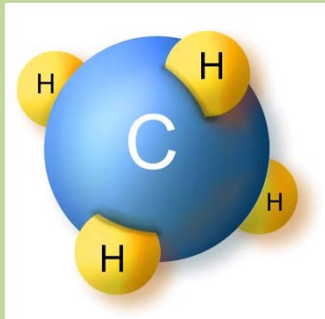
2000-12 (\$bn)



Source: Bloomberg New Energy Finance

1: Includes corporate and government R&D, and small distributed capacity. Adjusted for re-invested equity. Does not include proceeds from acquisition transactions.

What are we trying to do here?



Upstream hydrocarbon

- Primary energy input
- Depletable (reservoir)
- Measured in million boe
- Measured in barrels per day
- Risky investment



Renewable energy

- End products
- Non depletable
- Measured in installed capacity
- Measured in annual throughput
- Less risky investment



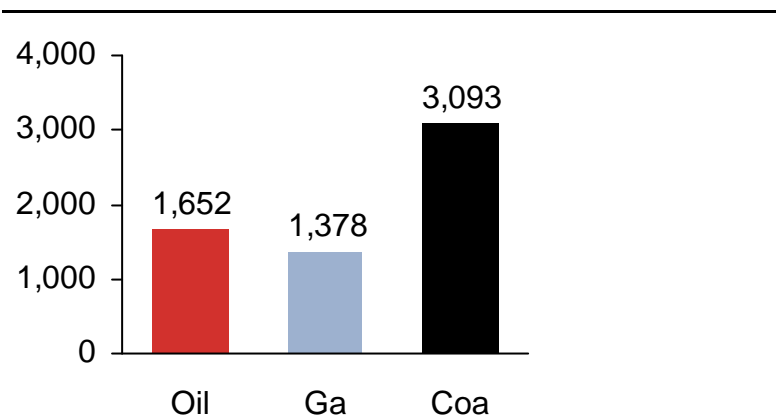
Downstream (refinery, power plants...)

- End products
- Not a resource
- Measured in installed capacity
- Measured in annual throughput
- Less risky investment

Is it relevant at global scale?

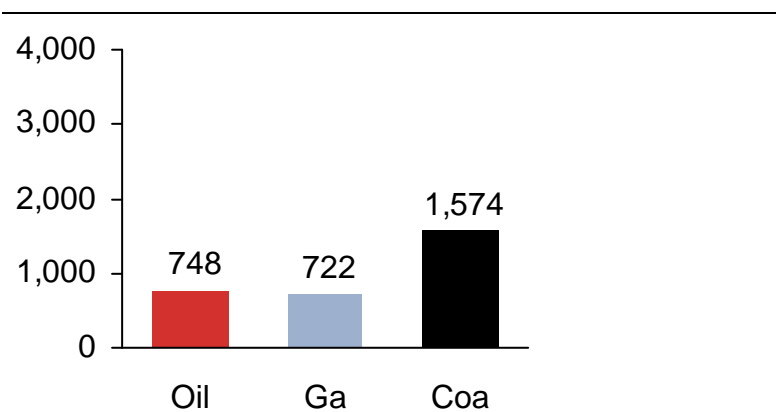
2012 proved fossil fuel reserves¹

bn boe



Contingent fossil fuel reserves⁴

bn boe



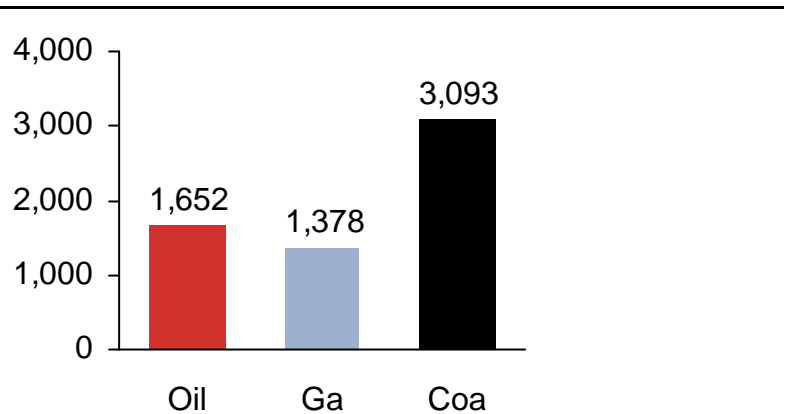
Notes: ² Converted on the basis of the small equivalence assuming 38% conversion efficiency requirements + some limited exports, ⁴ adjusted to remove unidentified resources, *adjusted to remove storage

Sources: ¹ BP Statistical Review 2012, ³ IEA World Energy Outlook 2011 & IEA Energy Technology Perspectives 2012, ⁴ USGS for oil & gas and World Energy Council for coal, ⁶ Federal Environment Agency (Umweltbundesamt), BP team analysis

Is it relevant at global scale?

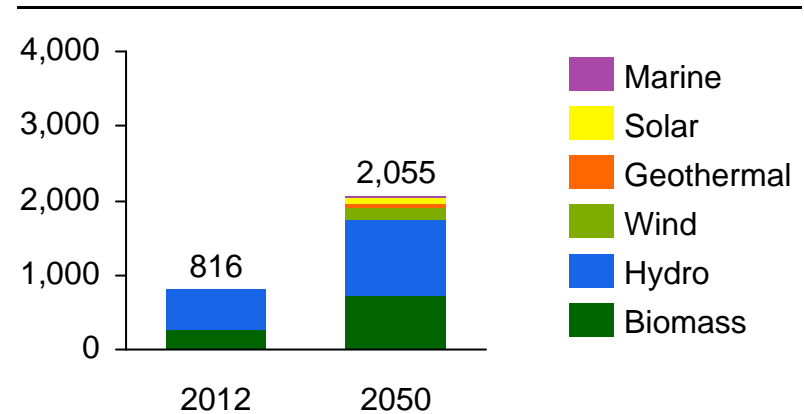
2012 proved fossil fuel reserves¹

bn boe



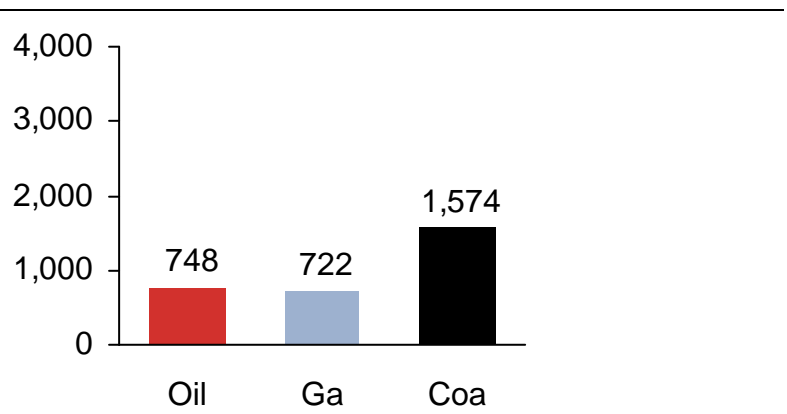
Energy eq.² recoverable from installed³ renewable assets

bn boe



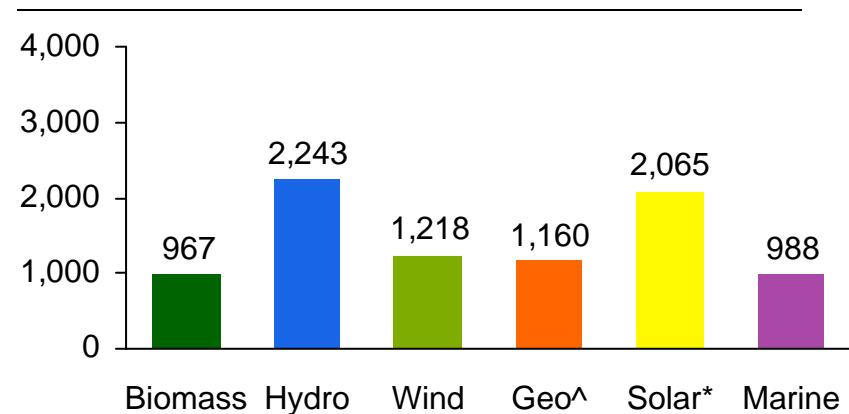
Contingent fossil fuel reserves⁴

bn boe



2050 technically available & usable⁵ renewable energy⁶

bn boe



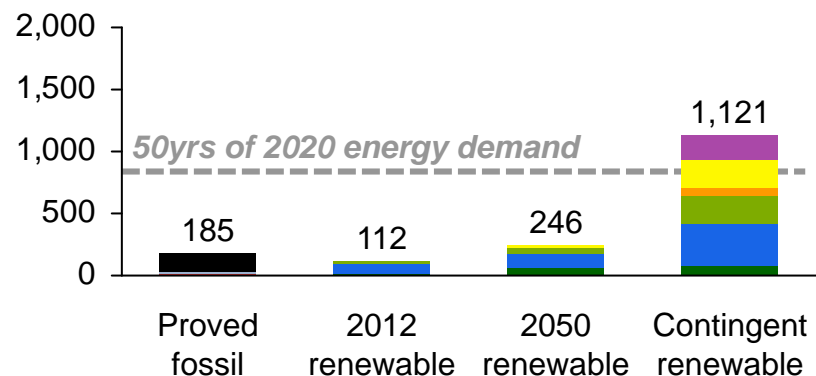
Notes: ² Converted on the basis of the small equivalence assuming 38% conversion efficiency in a modern thermal power station, ⁵ non-biomass maximum usable set by regional power sector requirements + some limited exports, [^]adjusted to remove unidentified resources, ^{*}adjusted to remove storage
 Sources: ¹ BP Statistical Review 2012, ³ IEA World Energy Outlook 2011 & IEA Energy Technology Perspectives 2012, ⁴ USGS for oil & gas and World Energy Council for coal, ⁶ Federal Environment Agency (Umweltbundesamt), BP team analysis

Is it relevant for governments?

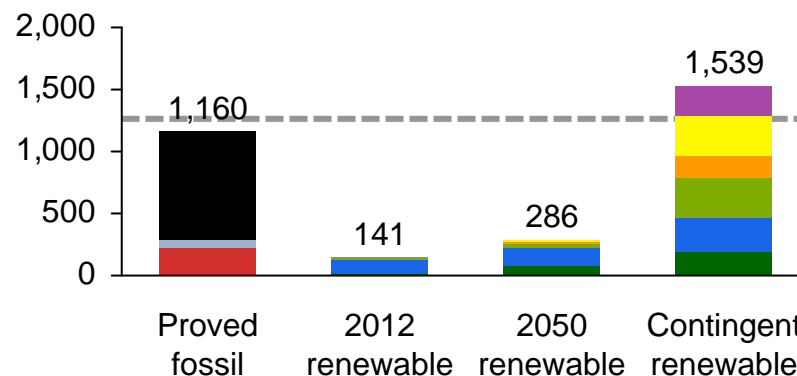
■ Marine ■ Solar ■ Geothermal ■ Wind ■ Hydro ■ Biomass ■ Coal ■ Gas ■ Oil

In Billion BOE

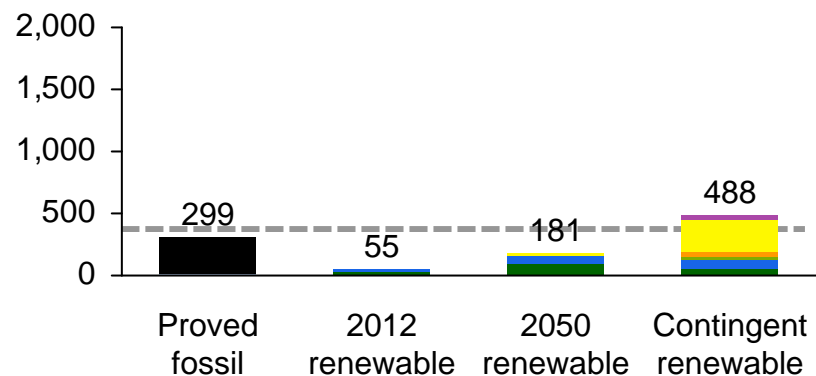
OECD Europe



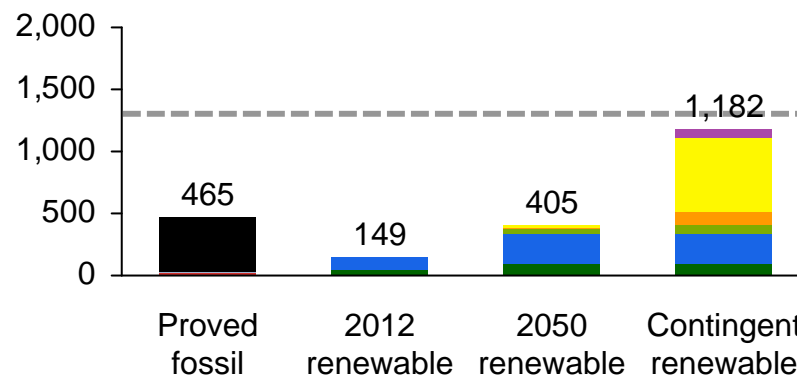
North America¹



India



China



Notes: ¹ U.S. / Canada / Mexico / Chile excluding Chile for contingent renewables and proved fossil, power sector renewables converted on the basis of thermal equivalence assuming 38% conversion efficiency in a modern thermal power station, non-biomass contingent renewables maximum usable resource set by regional power sector requirements + some limited exports
 Sources: BP Statistical Review 2012, IEA World Energy Outlook 2011, IEA Energy Technology Perspectives 2012, USGS, World Energy Council, Federal Environment Agency (Umweltbundesamt), BP team analysis

In summary, can we benefit from this initiative?

Internal stakeholders

- **Renewable asset owners**
 - Provide a measure of comparability with traditional energy systems, including financial metrics
 - Offer a basis to estimate the scale of each renewable resource
 - Provide reliable estimates based on best practices and common standards

External users

- **Investment community**
 - Better assess and contrast investment opportunities
 - Enhance portfolio valuation
- **Governments**
 - Better understand total resource base
 - Facilitate achievement of long-term integrated energy strategy
- **Global organisations**
 - Assess and contrast global energy systems and different energy sources
- **Other external users** (Interested public, accounting profession, technical consultants, etc.)