

G Axis Review Working Group Progress Report

**Expert Group on Resource Classification
Seventh session
Geneva, 26 – 29 April 2016**

G Axis Review WG - Terms of Reference

- **Mandate:**

- The EGRC 6th Session determined that there was a need to review the G axis name, category definitions and supporting explanations to better reflect the needs of the renewables sector without compromising their applicability to solid minerals and petroleum (paras 38 - 40).

- **Terms of Reference:**

- To form a G Axis Review Working Group consisting of expertise from the Renewable Energy sector, the current sectors covered by the classification (Oil & Gas, and Minerals), and generic expertise in the interpretation and application of the UNFC-2009 framework.
- To review the current G axis category definitions and supporting explanations, including the relevant sections in the proposed Renewable Energy Specification.
- To propose suitable modifications, if required, that would better reflect the needs of the proposed Renewables Energy specifications without compromising their applicability to solid minerals and petroleum.
- To propose suitable G axis name change(s), if required.
- To report back at the 7th EGRC session (April/May 2016) on progress/proposals.

- **Working Group:**

- **Interactions:**

- Renewable Taskforce
- Geothermal and Bioenergy WG

| Name | Expertise |
|------------------------|-------------------------|
| James Primrose (Chair) | Renewables (Bioenergy) |
| Paul Banks | Minerals (CRIRSCO) |
| Gioia Falcone | Renewables (Geothermal) |
| Jim Ross | Oil & Gas (PRMS) |

Report from EGRC 6th Session (extract)

38. The Chair noted that feedback from presentations on UNFC-2009 indicated the need for additional guidance regarding the G axis and the use of a Competent Person. Feedback had also been received regarding the naming of both the F and G axes.

39. The Expert Group recommended that any abbreviation of the G axis to “Geological knowledge” should be avoided and the full name “Geological knowledge and potential recoverability” be used wherever and whenever possible.

40. The Expert Group recommended that the G axis name, category definitions and supporting explanations be reviewed in detail during the next update of UNFC-2009 and one or more proposals developed for modifications that would better reflect the needs of the renewables sector without compromising their applicability to solid minerals and petroleum.

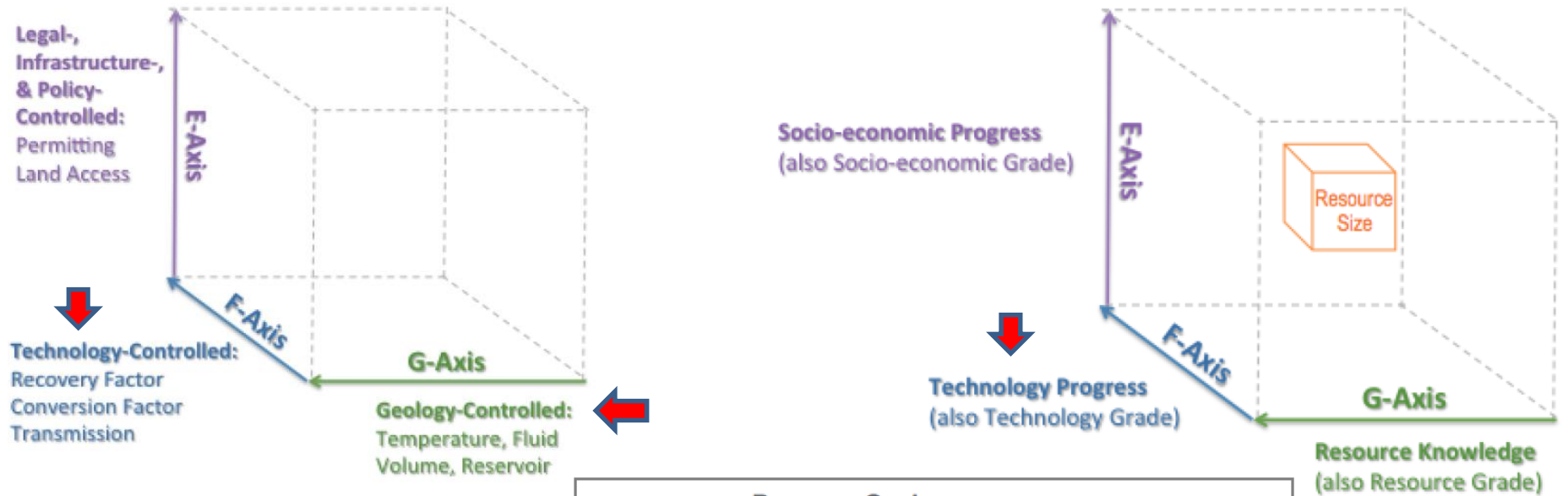
Key Findings

1. G Axis applicable to Renewable Energy Projects.
 - Confirms conclusion of Renewable Taskforce
 - Informed by further work on the Geothermal and Bioenergy Specifications.
2. Clearer guidance required on the application of uncertainty/levels of confidence.
 - Guidance contained in the bridged documents for fossil energy and solid minerals.
 - Clearer guidance on G1-2-3 & G4.1.-2- .3 required however in Renewable Energy Specification.
3. Ambiguity/confusion can be caused by the shortened name “geological knowledge”.
 - Sole focus on geological and/or sub-surface risks.
 - Potentially not unique to Renewable Energy Projects.
 - Expert Group has recommended that the full name “Geological knowledge and potential recoverability” be used when possible.
4. UNFC terminology not immediately transferable to non sub-surface resource projects.
 - A secondary issue, that is dealt with in the Renewable Energy Specification.
 - However a reminder that in the longer term as UNFC coverage widens a potential need to adopt more generic terminology.

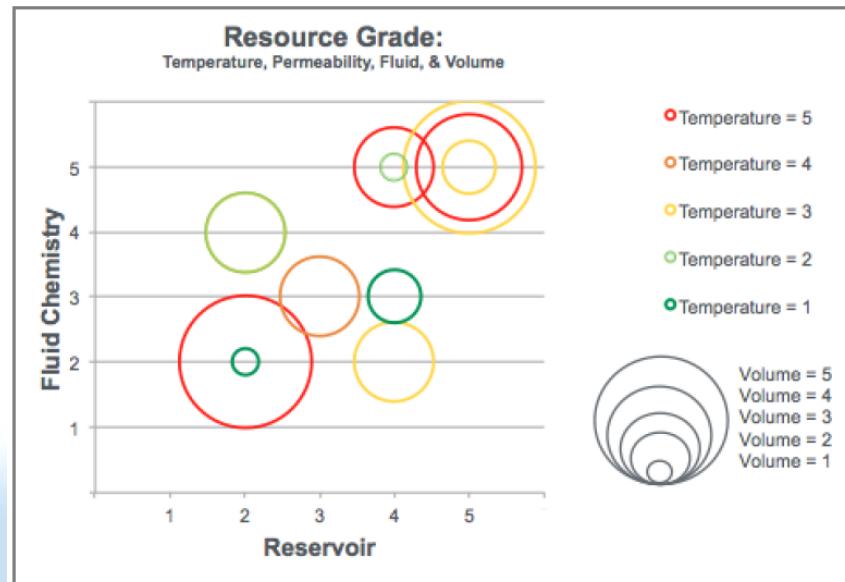
Deliverables

1. Provision of guidance to Geothermal and Bioenergy WGs on the use and application of the G Axis.
 - Invaluable context and guidance from the Oil & Gas, and Mineral sectors.
 - High degree of interaction and engagement between the G Axis WG, the Renewable TF, and the Geothermal/ Bioenergy WG, and TAG.
2. Proposed revision to the Draft Renewable Energy Specification.
 - Improved guidance on the treatment of uncertainty under the G Axis.
 - Explicit reference to the established approaches for determining estimates for G1, G2 and G3.
 - Incremental Approach
 - Scenario Approach
 - Probabilistic Approach
 - In principle all 3 approaches are open for Renewable Energy projects. In practice, Scenario or Probabilistic are likely to be the most appropriate.
 - “Elegant” solution that does not affect the existing bridging documents between UNFC-2009 and PRMS/CRIRSCO.

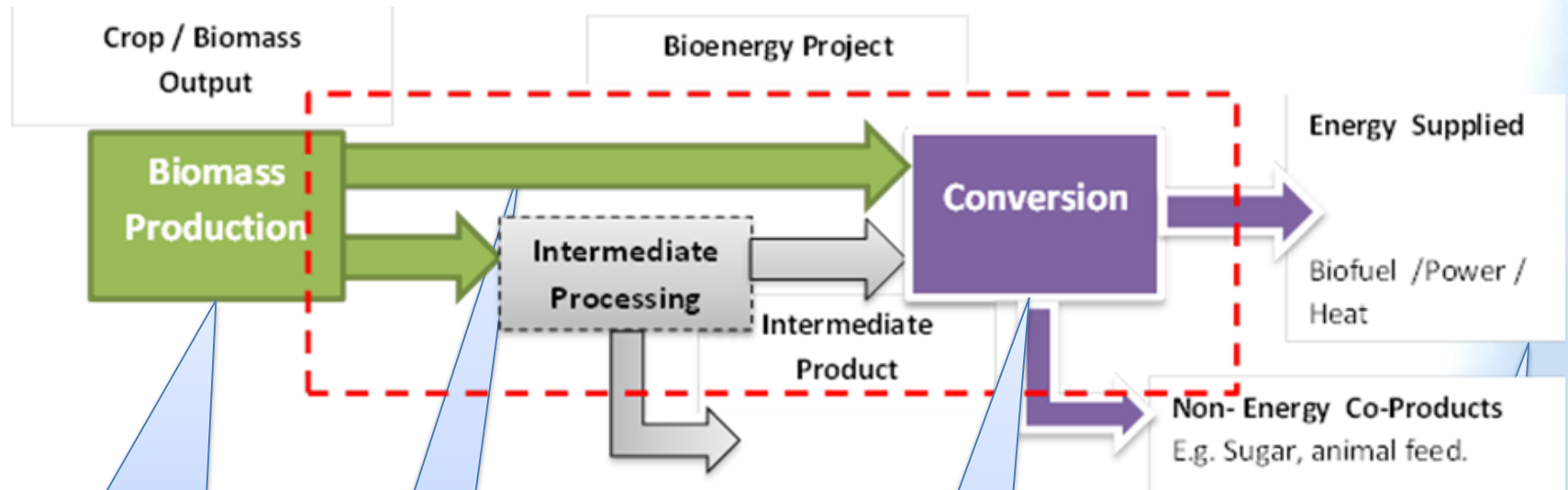
Sources of Uncertainty – Misunderstandings/Misuses – Geothermal Projects



(Young et al., 2015)



Sources of Uncertainty – Bioenergy Projects



Bioenergy Source

Biomass Yield
Biomass Quality

Access & Entitlement

Supply Longevity

Energy & Non-Energy Co-Products
E.g. animal feed, protein components.
Husks, kernel s, pips etc..

Conversion

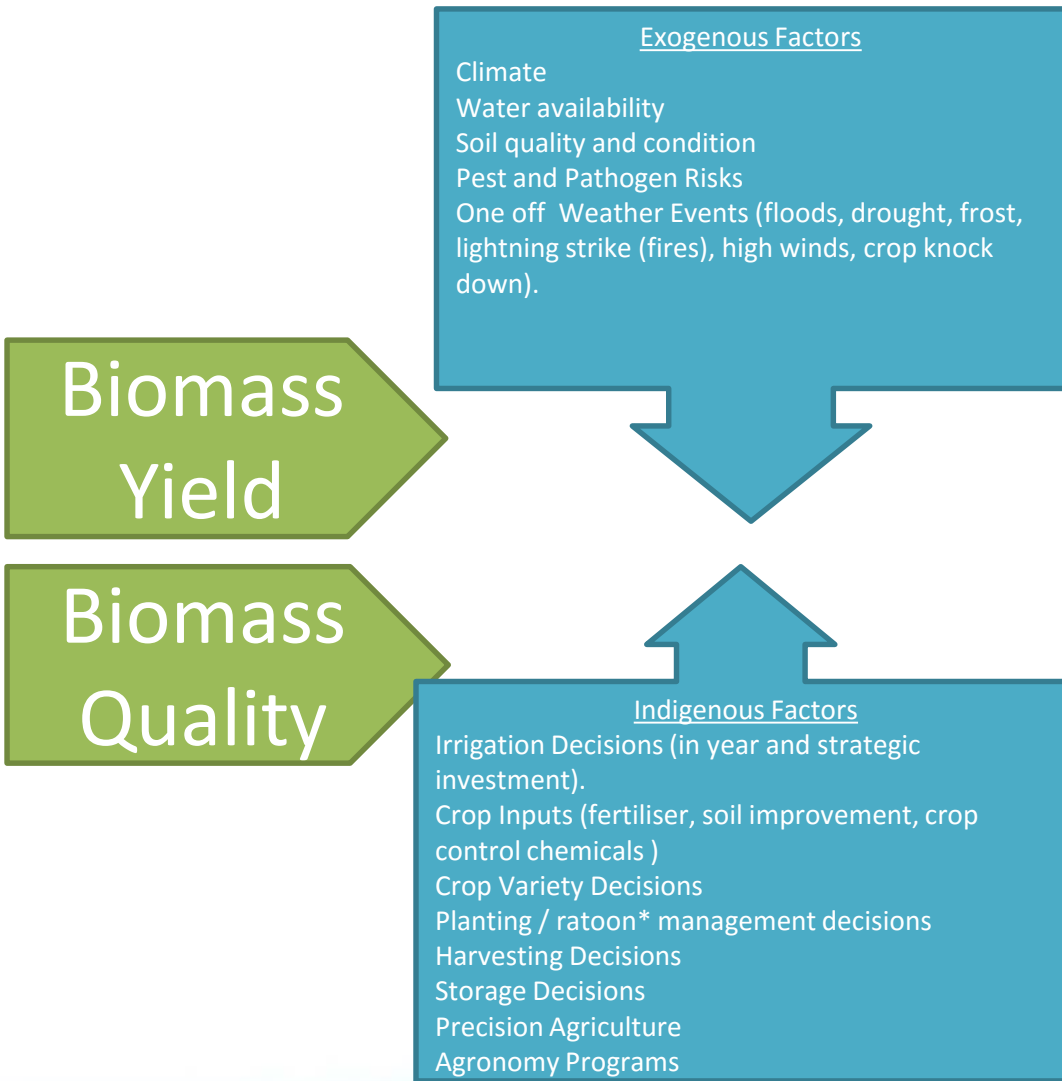
Throughput
Conversion Yield
Asset Life

Monetisation

LTCC / PPA Longevity
Regulatory Support



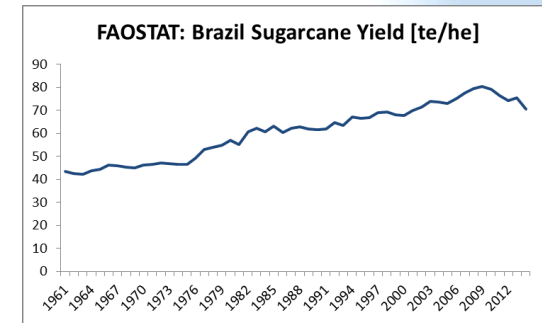
Sources of Uncertainty – Bioenergy Source



Parameterisation Options

Historic Data

- Project Specific
- Country/ Regional Databases

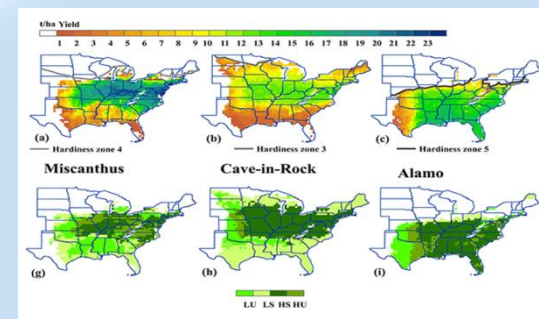


Crop Development Programs

- Public Research Institutes
- Germ-plasm Providers
- In house research



Yield Modelling



Ratoon = number of harvests between re-planting of a semi-perennial crop.

Forward Work Program

- Renewable Energy Specification Revisions.
 - Provide guidance / feedback if further comments / revisions to Specifications are made.
- Review of G Axis naming convention - proposals to be developed.
 - *De Minimis*: current full shortened name “Geological knowledge and potential recoverability”
 - WG to consider and develop options for future possible inclusion as part of a general UNFC 2009 review.
- Recommendation that WG continues to exist to act as a source of expertise on G Axis related issues while the Geothermal and Bioenergy Specifications are developed.

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