GEOCAP
Geothermal Capacity Building Program Indonesia · Netherlands

PPSDM Jakarta, November 2nd, 2017

Company decision-making for geothermal projects
(GEOCAP course 1.07)

Topic: Robustness of a decision

Lecturer - Ir. Christian Bos

Robustness of a decision

- **Definition of robustness / resilience: concept to be used when recommending a decision.**

- **Given a range of (probabilistic) forecasts of the performance of your asset, "robustness" means to have *adequate flexibility options* during the asset's life time such that the asset can be steered mid-course, i.e. *given new information*, to**
  - **1) continue to satisfy a given set of KPI-constraints within certain probability limits (*downside mgt*),**
  - **2) to further optimize the selected optimization-KPI (*upside management*).**

- **Example: given your framing and probabilistic forecast of NPV and IRR within this frame, to design flexibility options (i.e. controllable measures one can implement) such that when striking them at the appropriate time, will bring back / update the forecast NPV and IRR distributions (histograms) to within the accepted (predefined) range / below the risk tolerance norm.**
  - **We have to think in terms of dynamic options, and creating these options out of the uncertainty of the predicted range of the asset's performance.**

- **A set of undesired MC realizations can be shown + how timely striking built-in flexibility options can steer the NPV and IRR pdf's back to within some pre-defined constraints.**

26/10/2017   2

Conclusion

- Given the frame (i.e. selected models, scenarios, input pdf's, decision options etc.) a future decision (course of action / future option) can be tested for its impact on the future further down in time.

- If, given this frame, this further future remains within certain limits (boundary conditions) then the decision can be labelled "robust".
  - E.g. Risk < Risk tolerance
  - Or for a time-series, p_{xx} (e.g. p_{10}) forecast is better than the minimum acceptable time-series forecast

26/10/2017   3