Decision making related to energy

Oil and gas in the strategic ellipse: Arabian Peninsula, Caspian, Siberia

Uncertainties: economics (energy prices), global warming, technological progress, warfare (president Trump)

Uncertainty of interest: political risk

Typology of risk ➔ modeling ➔ quantification (διάλεξη σε Geopolitical Risk Analysis)

Normative/descriptive decision theory, empirically observable behaviors

Single decision maker (Decision Theory), a few decision makers (Game Theory), many decision makers (Complexity Science) (if they decide interactively)

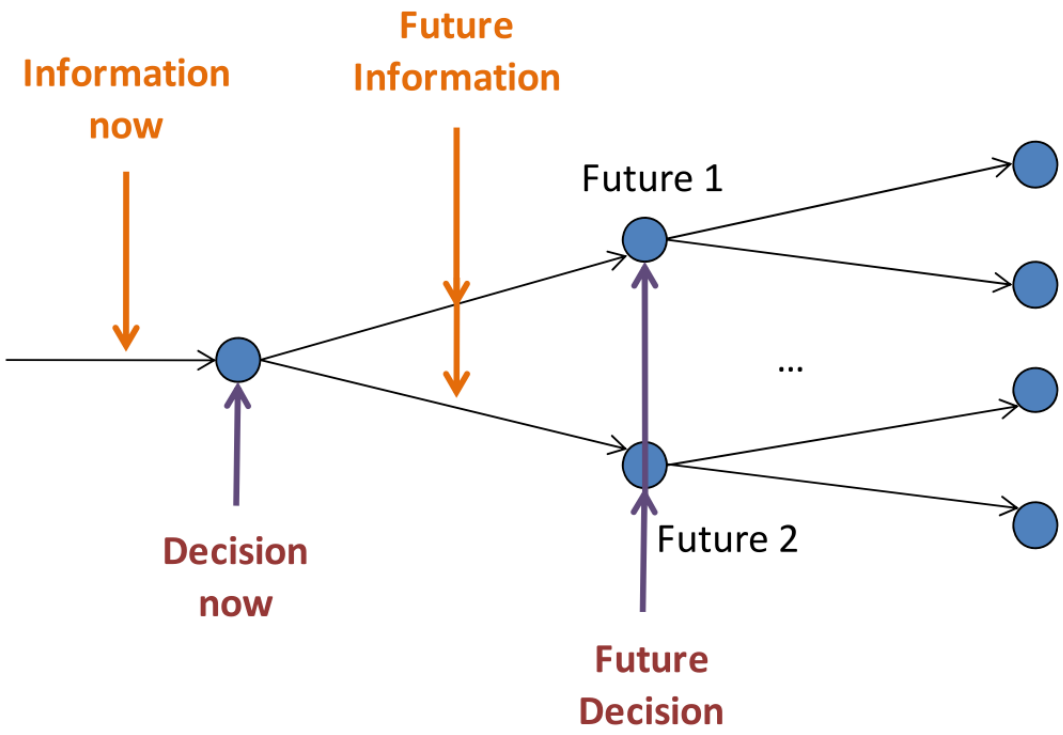
Decision maker has clear and consistent preferences (?)

Energy problems ➔ many stakeholders, preferences not well defined

Decisions under (1) certainty (rare), (2) risk, and (3) incertitude (determining probabilities is impossible, also called deep uncertainty)

Probabilities are subjective, heuristics may be used (such as maximin rule, i.e. Choose alternative that represents the best worst outcome)

Decisions are sequences, with information arriving intermediately



Preferences may reflect risk prone or risk averse behavior

Choices may preserve flexibility, e.g. by investing less capital

Political risk = political uncertainty

Risk = positive or negative deviations from expected outcome

(Political) risk analysis ➔ negative deviations

Parties in energy related decisions: policy makers, companies, households

Multiple persons involved: ministers, parliament, diplomats, administration

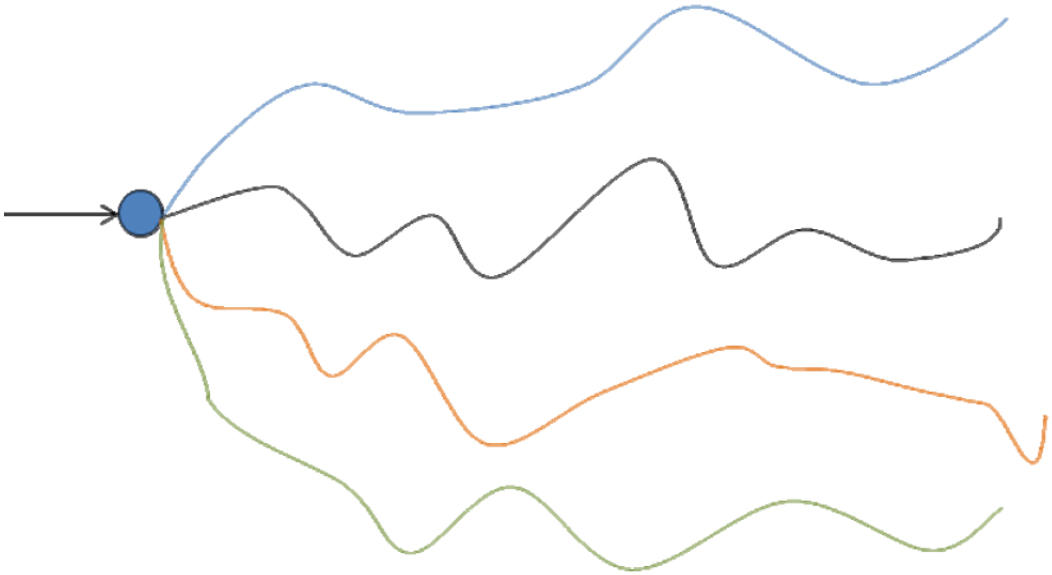
Scenarios are fundamental tool

Energy scenarios: potential alternatives, paths to desirable futures

SHELL scenarios: (1) SCRAMBLE, (2) BLUEPRINTS

IEA World Energy Outlook scenarios have different philosophy, e.g. 450 or 550 ppm CO_2 concentration policies

Real-world complexity is reduced to 2 to 5 alternative visions of the future



Typology of political risk: internal/external (markets, society, politics, national, supranational)

External political risk: hostile countries, international negotiations, treaties

Geopolitical risks: international negotiations (even trade liberalization), political turmoil, supply interruptions, reduced deliveries, excessive pricing, strikes, cartelization, warfare, terrorism attacks

Internal political risk: legislative (jurisdictional and administrative), debate e.g. on nuclear power, promotion of renewables, elections, plebiscites, protests, upheavals, public pressure, media campaigns

Table 1: Overview of stakeholders affected by different types of political risks

Stakeholders	External political risks		Internal political risks		
	Geopolitical risk	Risk of international treaties	Legislative and regulatory risk	Democratic and plebiscitary risk	Juridical and administrative risk
Households	X	X	X	(X)	(X)
Companies	X	X	X	X	X
Policy makers	X	X		X	X

More on modeling/quantifying political risk forthcoming (Geopolitical Risk Analysis)