How Much Evaluation is Enough?

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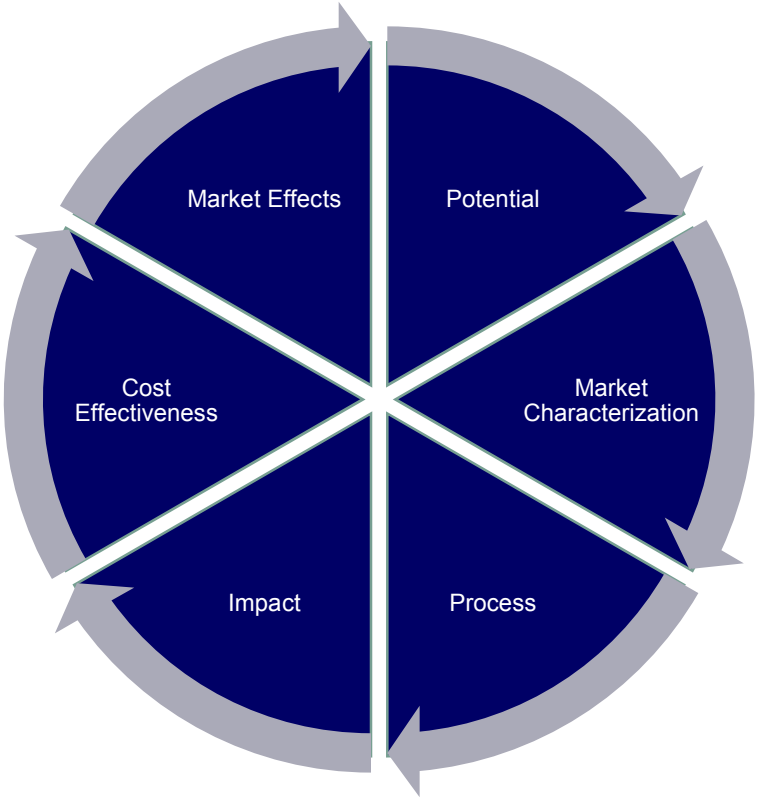
Why ask how much is enough?

- EPA Clean Power Plan
  - Presents EM&V Guidance that still requires reward/risk assessment
- A smart thing to think about regardless of EPA or any other particular targets or goals

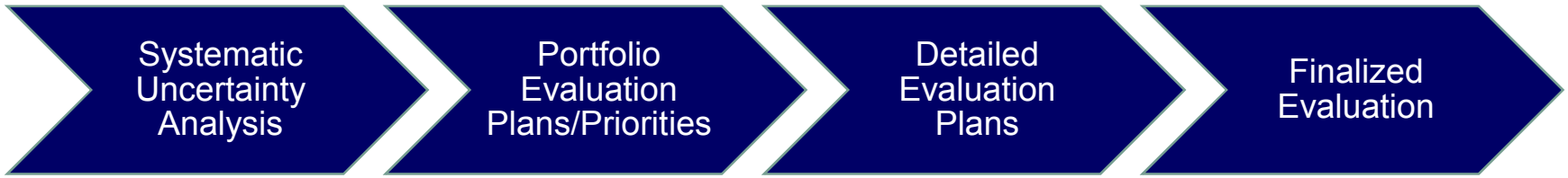
Major evaluation study types



Why a systematic approach?

- Could be used to compare one state to another
- More useful purpose is to document a risk assessment baseline that studies in future evaluation cycles can be calibrated against

Feeds evaluation planning



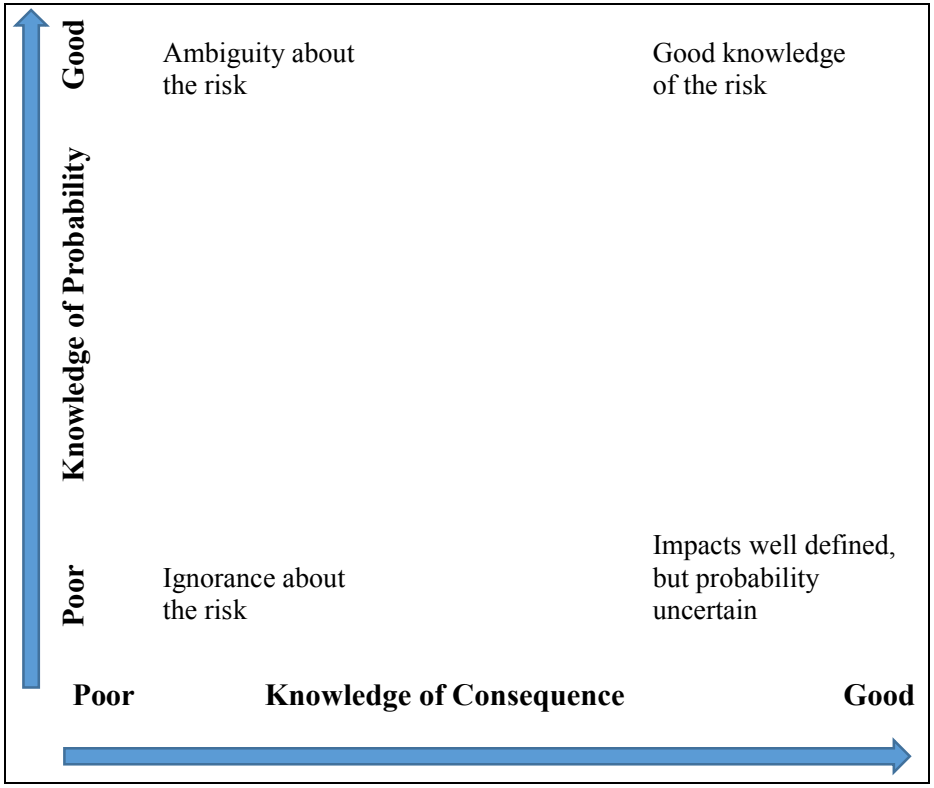
Who else does this?

- Climate change/climate adaptation science
  - Uncertainty assessment drives mitigation and adaptation choices
- Water, resources management
  - Cost of efficiency versus cost of shortage/loss
- Health research
  - Total harm versus total good

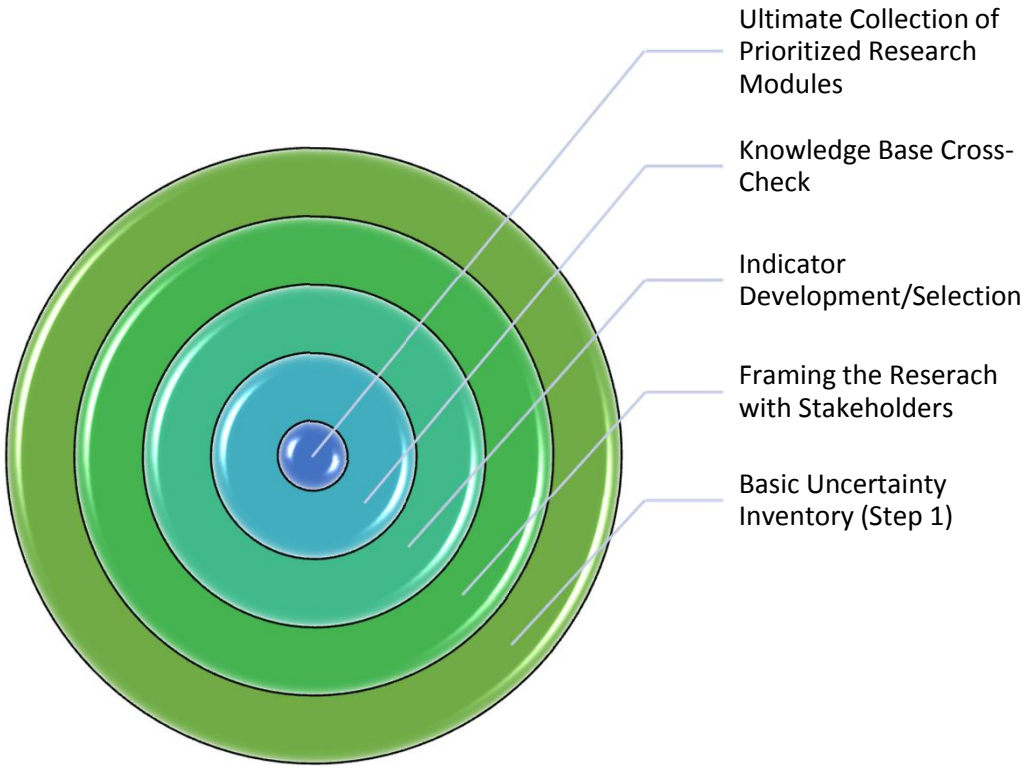
Key questions

- Is it time to act?
- Where to focus attention?

Is it time to act?



Where to focus attention?



Uncertainty Matrix

- Cross-tab:
  - the level and nature of the uncertainty

  and
  - the sociopolitical context, expert judgement, modelling issues, data issues and output choices

  with the addition of
  - qualification of existing knowledge and assessment of values/biases

UNCERTAINTY MATRIX			Level of uncertainty (deterministic knowledge – total ignorance) (knowing for certain – not even knowing what you do not know)			Nature of uncertainty		Qualification of knowledge base (backing)			Value-ladenness of choices		
Location of uncertainty ⇩			Statistical uncertainty (range + chance)	Scenario uncertainty (range = "what-if" option)	Recognized ignorance	Knowledge-related uncertainty	Variability-related uncertainty	Weak -	Fair 0	Strong +	Small -	Medium 0	Large +
Context	Assumptions on system boundaries plus economic, environmental, technological, social and political context												
Expert judgement		Narrative; storyline; advice											
M o d e l	**Model structure**	Relationships and inclusions											
	Technical model	IPMVP; UMP; Cost tests;											
	Model parameters												
	Model inputs	Quality of input data											
Data	Measurements; consumption and billing information; potential studies; market characterization; process and impact evaluation; cost-effectiveness results; market effects studies												
Outputs	Indicators; statements; broad range of possible evaluation results												

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		advice		
Model	**Model structure**	Relationships and inclusions		
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Thank you

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