

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 O	Strong +	Small -	Medium 0	Large +	
Context	Assumptions boundaries plu environmental, t social and polit	on system s economic, technological, tical context											
Expert judgement Narrative; storyline; advice													
м	Model structure	Relationships and inclusions											
o d	Technical model	IPMVP; UMP; Cost tests;											
e	Model para	ameters											
1	Model inputs	Quality of input data											
Data	Measurements; and billing inform; studies; market ch process and impa cost-effectiver market effec	consumption ation; potential naracterization; act evaluation; ness results; ts studies											
Outputs Indicators; statements; broad range of possible evaluation results													



UNCERTAINTY MATRIX		(deterministic (knowing fo what	el of uncerta : knowledge – to r certain – not e at you do not kn	inty otal ignorance) ven knowing ow)	Nature of uncertainty		Quali
Location of uncertainty		Statistical uncertainty (range + chance)	Scenario uncertainty (range = "what-if" option)	Recognized ignorance	Knowledge- related uncertainty	Variability- related uncertainty	Wea -
Context Assumptions on system boundaries plus economic, environmental, technological, social and political context							
	Narrative;				l	l	



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		advice		
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м		inclusions		
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	Technical model	UMP; Cost		
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	Model inputs	Quality of		
	wodermputs	input data		
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	Measurements; consumption			
	and billing informa			
Data	studies; market ch			



I	Model inputs	Quality of input data	
Data	Measurements; and billing informa studies; market ch process and impa cost-effectiven market effec	consumption ation; potential aracterization; act evaluation; ess results; ts studies	
OutputsIndicators; statementOutputsrange of possible evaluationresults		ments; broad e evaluation ts	







Thank you

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