

EXAMPLE FROM THE POWER TO RENEW













ORACLE FOR THE FUTURE OF SUSTAINABLE ENERGY:

Designing a Delphi Approach to Predict Future Trends through a Panel of Global Experts

American Evaluation Association - Evaluation 2019 | November 11-16, 2019





AGENDA

- 1 What is Delphi?
- 2 Application in Renewable Energy Evaluation
- 3 Delphi Process
- 4 Participant Activity Round 1
- 5 Renewable Energy Case Example
- 7 Participant Activity Round 2
- 8 Results from Renewable Energy Evaluation



METHOD: DELPHI TECHNIQUE OVERVIEW

- Developed in the 1950s (Rand Corp.), named for Ancient Greek 'Oracle' who predicted future
- Emphasizes forecasting looks at "what could/should be"
- Solicits anonymous/confidential opinions and information from subject matter experts – "[More] heads are better than one"
- Uses systematic and iterative approach through multi-stage questionnaires/templates

What can you get from a Delphi approach?

- Generates ideas and alternatives
- Transforms individual expertise towards informed group judgment and consensus
- Controlled feedback process that is interactive and iterative

EVALUATION: WBG SUPPORT TO RENEWABLE ENERGY DEVELOPMENT

DELPHI QUESTIONS:

What are emerging

- 1) CHALLENGES and
- 2) OPPORTUNITIES to developing RE, and what may be
- 3) WBG'S ROLE in helping clients address challenges and seize opportunities

- Renewable Energy (RE) for meeting energy demand in an environmentally sustainable way
- SDGs and Paris Agreement stresses RE as a key solution
- Theory of Change: WBG's key contribution is helping address key barriers to investments in RE
 → leads to ↑ electricity supply → avoided CO₂
- Dynamically evolving sector expected to continue to disrupt
- Learning from past may not always be lessons for future



EVALUATION: MULTI-METHOD APPROACH

Structured SLR Barriers SLR Benefits/ RE Market Literature to RE **Impacts of RE** Review Review **EVALUATION QUESTIONS Portfolio** CAS/CPF **CBA/In-Depth** 546 RE Projects/ <u>245</u> Review & ASA/AS **Strategies Hydro Review** Investments **Analysis** QCA Comparative 9 In-Depth 19 PPARs **Case Studies Causal Analysis Country Studies** Semi Other **Public & Private WBG Staff** Structured **Partners WBG Clients** Survey/Interviews **Interviews** Global **Delphi Panel of Expert Panel Global Experts on RE**



WHO? IDENTIFYING GLOBAL EXPERTS ON RE

- Experts on Subject Matter
- Diversity of Expertise
 RE,CC, Public/Private,
 Developed/Developing
- Facilitators
 w/ knowledge of sector and
 understanding of methodology

President & CEO
GE Renewable Energy

Professor,
University of Maryland,
Fellow,
Brookings Institute

President
Chinese Renewable
Energy Association, China

Investor
Berkeley Energy and
Chairman of Catalyst
Principle Partners

(former) Minister
Public Service,
Sustainable Development,
Energy, Science and
Technology, Saint Lucia

Chief Economist International Energy Agency

Director General
The Energy & Resources
Institute (TERI), India

Professor
Basque Center
for Climate Change





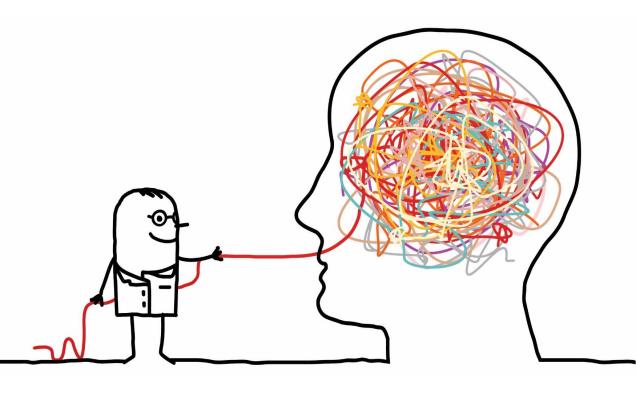
APPROACH: IDEA GENERATION AND PRIORITIZATION (ROUND #1)

Expert Panelists:

- "Blank slate" with <u>confidential</u> idea generation
- Score items for prioritization
- Return completed templates to Facilitators

Facilitators:

- Review and compile main themes and scores from panelists
- Seek clarifications from individual panelists, as needed
- Prepare a synthesis for sharing an updated template in Round 2





APPROACH: REVIEW, SYNTHESIS, RE-SCORE (RE-PRIORITIZE), CLOSURE (ROUNDS #2...n)

Expert Panelists:

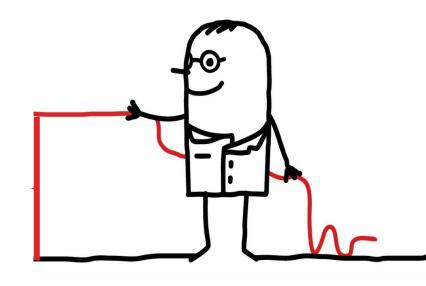
- Review synthesis
- Rescore to indicate updated priorities
- Add any additional comments
- Return confidential completed templates to Facilitators

Facilitators: Same as Round 1

NOTE: Iterative rounds can continue as needed, but requires more time

CLOSURE: Complete synthesis report with analytical findings (themes, priorities) including methodological approach used

Disseminate (if stand-alone document) or utilize findings (in evaluations to triangulate conclusions).





Participant Activity

Round 1

Panel: You all are experts on program evaluations.

Question: If we talked to clients who procure evaluations, what would they say is the single most important area for improving the utilization of evaluation results?

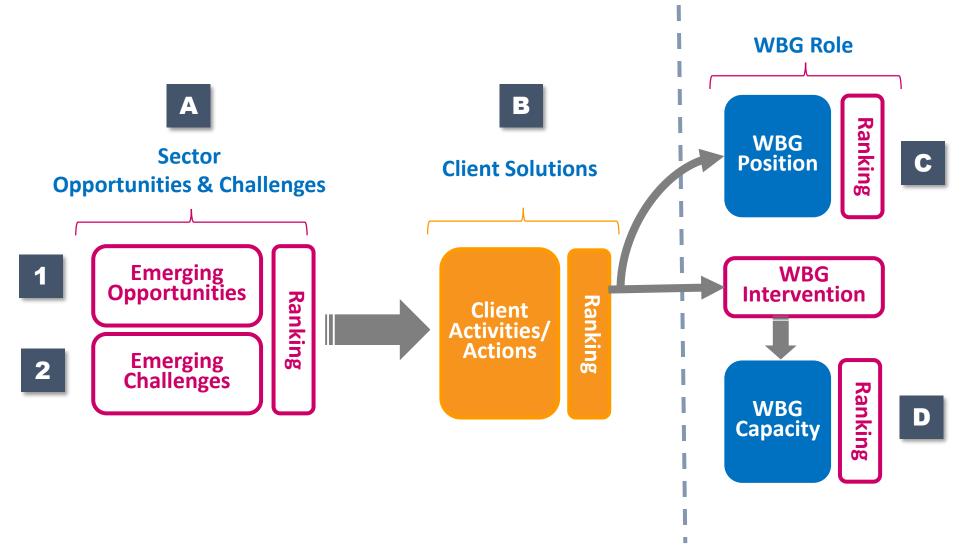


Submit only one priority answer at: www.pollev.com/iegnow



TEMPLATES: DESIGN AND STRUCTURE

- 2 Templates w/ instructions
- Priority Ranking by Score and Likert-Scale
- Completed templates submitted to Facilitators





TEMPLATES: EXAMPLES

The Power to RE new: Evaluation of the World Bank Group's
Support to Renewable Energy Development



DELPHI HIGH-LEVEL GLOBAL EXPERT PANEL ON RENEWABLE ENERGY:
RESPONSE TEMPLATES

TEMPLATE 1: OPPORTUNITIES

The Power to RE new: Evaluation of the World Bank Group's Support to Renewable Energy Development



DELPHI HIGH-LEVEL GLOBAL EXPERT PANEL ON RENEWABLE ENERGY:
RESPONSE TEMPLATES

TEMPLATE 2: CHALLENGES

RESPONSE TEMPLATE 1 OF 2: OPPORTUNITIES

	EMERGING <u>OPPORTUNITIES</u> TO DEVELOPING RE GOING FORWARD							
		RE SECTOR OPPORTUNIT	WBG POSITIONING AND CAPACITY TO HELP CLIENT COUNTRIES					
#	Main emerging opportunities to further develop RE in developing countries (Please be concise)	Rationale for selection of opportunities (Why?) (Please provide details)	Priority Score: Between 0 - 100 (Column total must add to 100)	What action(s) should be taken by developing countries to seize the opportunity?	How well do you think is the WBG positioned to help clients successfully carry out the action(s) to seize the opportunity? (Using the 4-point scale in the drop-down list)	What intervention(s) should the WBG undertake to help clients implement the action? (Please be specific and provide details)	How do you assess the current capacity of the WBG to successfully implement each intervention? (Using the 4-point scale in the drop-down list)	
1	Click here to enter an opportunity.	Click here to enter your rationale.	Click here to enter your score.	Click here to enter an action.	Choose an item.	Click here to enter a WBG intervention. Click here to enter a WBG intervention. Click here to enter a WBG intervention.	Choose an item. Choose an item. Choose an item.	
				Click here to enter an action.	Choose an item.	Click here to enter a WBG intervention. Click here to enter a WBG intervention. Click here to enter a WBG intervention.	Choose an item. Choose an item. Choose an item.	
				Click here to enter an action.	Choose an item.	Click here to enter a WBG intervention. Click here to enter a WBG intervention. Click here to enter a WBG intervention.	Choose an item. Choose an item. Choose an item.	
2	Click here to enter an opportunity.	Click here to enter your rationale.	Click here to enter your score.	Click here to enter an action.	Choose an item.	Click here to enter a WBG intervention. Click here to enter a WBG intervention. Click here to enter a WBG intervention.	Choose an item. Choose an item. Choose an item.	
				Click here to enter an action.	Choose an item.	Click here to enter a WBG intervention.	Choose an item.	





Participant Activity

Round 2

Based on your input previously, we have narrowed down to the top most frequent responses.

Question: Can you rank this list as to what you see are as the most important to improving evaluation utilization, in priority order (top being the highest priority)?



Provide your answer by clicking on options and using up or down arrows to reorder your list www.pollev.com/iegnow



RANKING OF CHALLENGES BASED ON DELPHI RESULTS

Category 4.38 /(0.48) 1. Existing interests that may hinder development of RE 2. Inadequate and unstable policy and regulatory 4.25 /(0.43) 5. Difficult to integrate large amounts of RE, especially those 4.00 /(0.50) 1 (12.5%) of variable/intermittent nature 10. Capacity within government agencies to support and 4.00 /(0.50) (12.5%) develop RE 14. Regulatory and counterparty risk keep cost of capital high (12,5%) 3.88 /(0.60) 4. Need Bankable projects and PPAs 1 (12.5%) 3.63 /(1.11) 3 (37.5%) 3.38 /(1.22) 3. Lack of "real" commitment to Decarbonize power system 6. Need Local industry to create strong interest in RE 2 (25%) 3.38 /(0.99) promotion 3.38 /(0.70) 9. Improve systems and capacity to reduce project delays 13. Difficulty mobilizing financing for RE in smaller 2 (25%) 3.38 /(0.86) countries/markets that may be less lucrative for developers 8. Strengthen capacity for transparency and accountability to 3.38 /(0.48) address corruption and governance 3.13 /(1.05) 7. Need champion to drive RE development Process 3 (37.5%) 12. Affordability of off-grid equipment and aftersales care for 3.00 /(1.00) 1 (12.5%) (12.5%) poorer populations 1 (12.5%) 16. Large land requirements for developing RE 2 (25%) 2.88 /(1.05) 15. Rapid decline in technology costs could lead to slower 1 (12.5%) 2.88 /(0.78) uptake as utilities & developers take wait-and-see approach 11. Vulnerability of RE systems to extreme weather and 2.25 /(0.83) 5 (62.5%) 1 (12,5%) climactic events 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 Number of Voting Mean Score / StDev.

RE Barrier Classification

- Policy and regulatory
- Integration into power system
- Improvement to design & technical standards
- Strengthen institutional capacity
- Mitigate investment risks
- Mobilizing financing
- Others

Importance Score

- Very High=5
- High=4
- Moderate=3
- Low=2
- Very Low=1





NESTED RANKINGS OF ACTIONS/SOLUTIONS

	No.	Challenge	Actions/Solutions		
Р	1	Existing (vested) interests	Phase-out fossil fuel power plants over time, starting with the most polluting ones Legislate clear long-term RE targets and agree with utility how to achieve these targets Create alternative employment for areas impacted by removing fossil electricity production Legislate market liberalization to allow IPPs Stop building fossil fuel based power plants Bring off-grid options into long term electrification plan Learn from successes of other countries	4 3 1 1 7 1 6 1 4 4 3 1 1 6 1	4.38 /(0.70) 4.13 /(0.33) 4.00 /(0.50) 4.00 /(1.00) 3.88 /(1.17) 3.75 /(1.09) 3.63 /(0.48)
			 Remove subsidies on kerosene Increase awareness on job creation potential of RE Experiment with off-grid electrification concessions Provide incentives to convert conventional power plants into RE and/or storage Remove VAT and import duty on solar 	2 3 2 1 4 3 1 1 2 4 1 2 1 2 3 1 1 4 1 1	3.63 (1.22) 3.38 /(0.70) 3.25 /(1.09) 3.25 /(1.20) 3.00 /(1.12)
P 2		Policy and regulatory infrastructure	 Develop stable policy frameworks that support RE development Establish Independent Electricity Regulator Undertake Electricity sector restructuring Develop national RE strategies and Long-Term Plans 	4 3 1 3 3 2 3 3 2 2 4 2	4.38 /(0.70) 4.13 /(0.78) 4.13 /(0.78) 4.00 /(0.71)
P	3	Commitment to decarbonize power system	 Developing countries should insist donors coordinate their assistance for RE Countries should use their voice as WBG shareholders and demand change 	1 1 5 1 1 6 1	3.13 /(1.05) 3.00 /(1.00)
	4	Bankable projects and PPAs	Streamline permitting process to speed-up approvals	1 3 4	3.63 7(0.70)
	5	Integration of large amounts of RE	Integration of grid systems Integration of grid systems Strengthen capacity of grid operators Promote pumped storage hydro and battery storage Undertake Long-Range Transmission Planning Unlock flexibility in generation and the demand side by creating appropriate market incentives Reconfigure electricity markets to provide for price discovery of balancing power Develop Smart Grids Develop risk guarantee mechanism to provide fossil-based plants with capacity cost Progressively move to reflect full RE costs, especially as their share in energy generation rises	4 3 1 3 4 1 1 6 1 2 3 2 1 1 4 2 1 1 3 4 1 3 3 1 4 3 1 2 5 1 2 5 1	4.38 //(0.70) 4.25 /(0.66) 4.00 /(0.50) 3.75 /(0.97) 3.63 (0.86) 3.63 (0.70) 3.50 /(0.87) 3.38 /(0.70) 3.13 /(0.60) 3.13 /(0.60)
T	6	Local RE industry	Technologies transfer. Obtain manufacturing capabilities. Support manufacturing of renewable energy equipment	1 2 4 1 1 3 2 1 1	3.38 /(0 86) 3.25 /(1.20)
C	7	Champion to drive RE	Training on RE for business people, managers and engineers	2 2 4	3.75 /(0.83)
C	8	Anti-corruption and governance	 Encourage the rule of law through strong anti-corruption laws and robust, consistent enforcement. 	3 3 2	4.13 /(0.78)
C	9	Implementation delay of RE projects	 Streamline permitting and development processes, including adequate environment review and land acquisition 	3 2 3	4.00 /(0.87)
	10	Capacity within government agencies	 Training on RE for business people, managers and engineers Seek support from development partners to assist with negotiations that need to be undertaken 	3 2 3 2 1	4.00 /(0.87) 3.75 /(0.97)
R	11	Vulnerability of RE systems to extreme weather a		1 4 2 1	3.63 (0.86)
F	12	Affordability of off-grid equipment and aftersales care	 Support PAYGO Systems with intermediaries who rent and service equipment that depends on RE Provide some targeted subsidies to poor households to be able to rent RE-related equipment Provide training of women from rural communities to service and maintain RE systems 	2 4 1 1 1 4 2 1 1 4 2 1	3.75 /(1.20) 3.63 / (0.86) 3.63 / (0.86)
F	13	Mobilizing financing in country small markets	 Explore opportunities for de-risking some investments, through the use of grant or concessional financing Organize small countries to pool similar projects in the same region 	2 3 2 1	4.50 /(0.50) 3.75 /(0.97)
F	14	Risks keeping cost of capital high	Create a clear and robust investment framework Minimalize counterparty risk	4 2 2 1 6 1	4.25 /(0.83) 4.00 /(0.50)
F	15	Rapid decline in RE costs causing utilities to delay	Introduce pooled prices for RE electricity	2 1 3 2	3.38 /(1 11)
0	16	Large land requirement for RE	Require that the design of large hydro dams must be more environmentally sensitive Require resettlement with full engagement of stakeholders and flowing the state of the art guidelines Create a licensing regime that balances renewable development with legitimate land use concerns Do not allow biomass expansion at the expense of good agricultural land. Priority lending for repowered RE systems Create an investment framework which creates incentives for renewable developers Retention of older (and higher) tariffs for repowered RE plants	3 3 1 1 2 3 2 1 1 4 2 1 3 2 1 1 1 1 1 5 1 3 3 1 1 2 4 2	4.00 /(1.00) 3.75 /(0.97) 3.63 (0.86) 3.63 (1.41) 3.25 /(0.83) 3.00 /(1.00) 3.00 /(0.71)
				0 2 4 6 8 Number of Voting	2.00 3.00 4.00 5.00 Mean Score / StDev.

RE Barrier Classification

- Policy and regulatory
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- Low=2
- Very Low=1





APPROACH: APPLICATION IN EVALUATION

- Policy and regulatory framework one of top impediments to scaling-up RE (reinforced as essential barrier by QCA)
- Integration of RE is top 3 priority (90 percent = 'high' or 'v. high' importance), but WBG 'moderately well' positioned to address, (including due to limited experience with emerging area of electricity storage)
- Mitigating investment risks assessed as 'highly important' by 2/3 of panel
- 90% of panel identified training of government officials as 'very important'
- Vested interests w/ stakeholder is top challenge, providing justification for WBG systematic and coordinated engagement to address barriers
- Distributed Generation (approach fast-gaining traction) had mixed opinions (40% important by panel, although 80% of staff saw it as very important)





