
Barriers and solutions to the development of renewable energy technologies for power generation on Caribbean island states

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Sustainable Energy Project Development Workshop:
Experience, Strategies and Implementation

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-
- Problem
 - Methodology
 - Results
 - Recommendations
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Research Problem



Diesel Generator Power Plant in Bequia

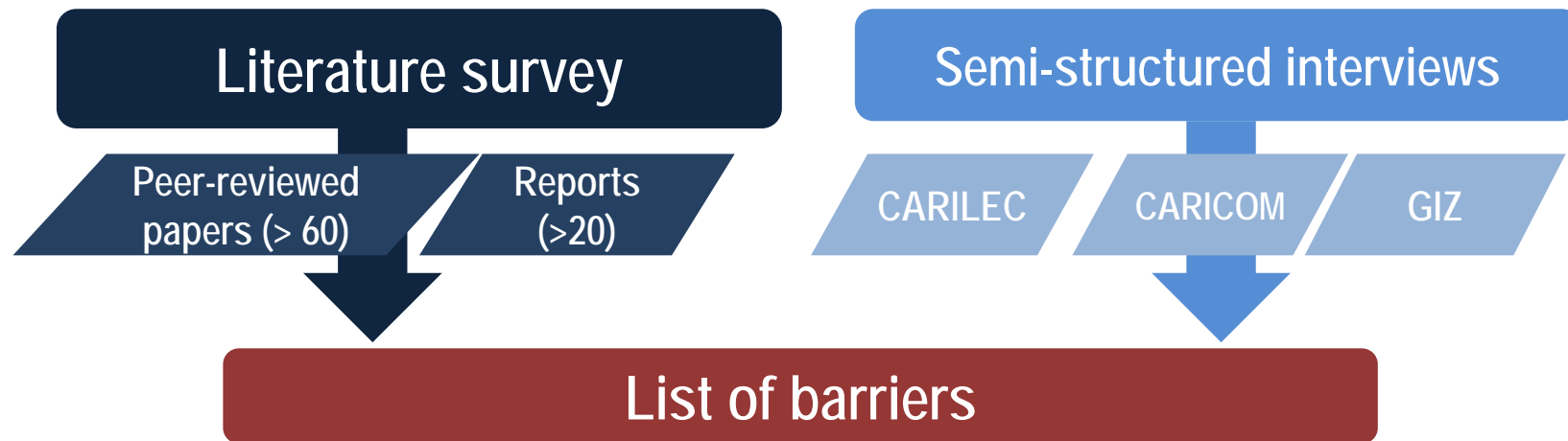
**BUT:
Barriers of
Implementation**

Transformation

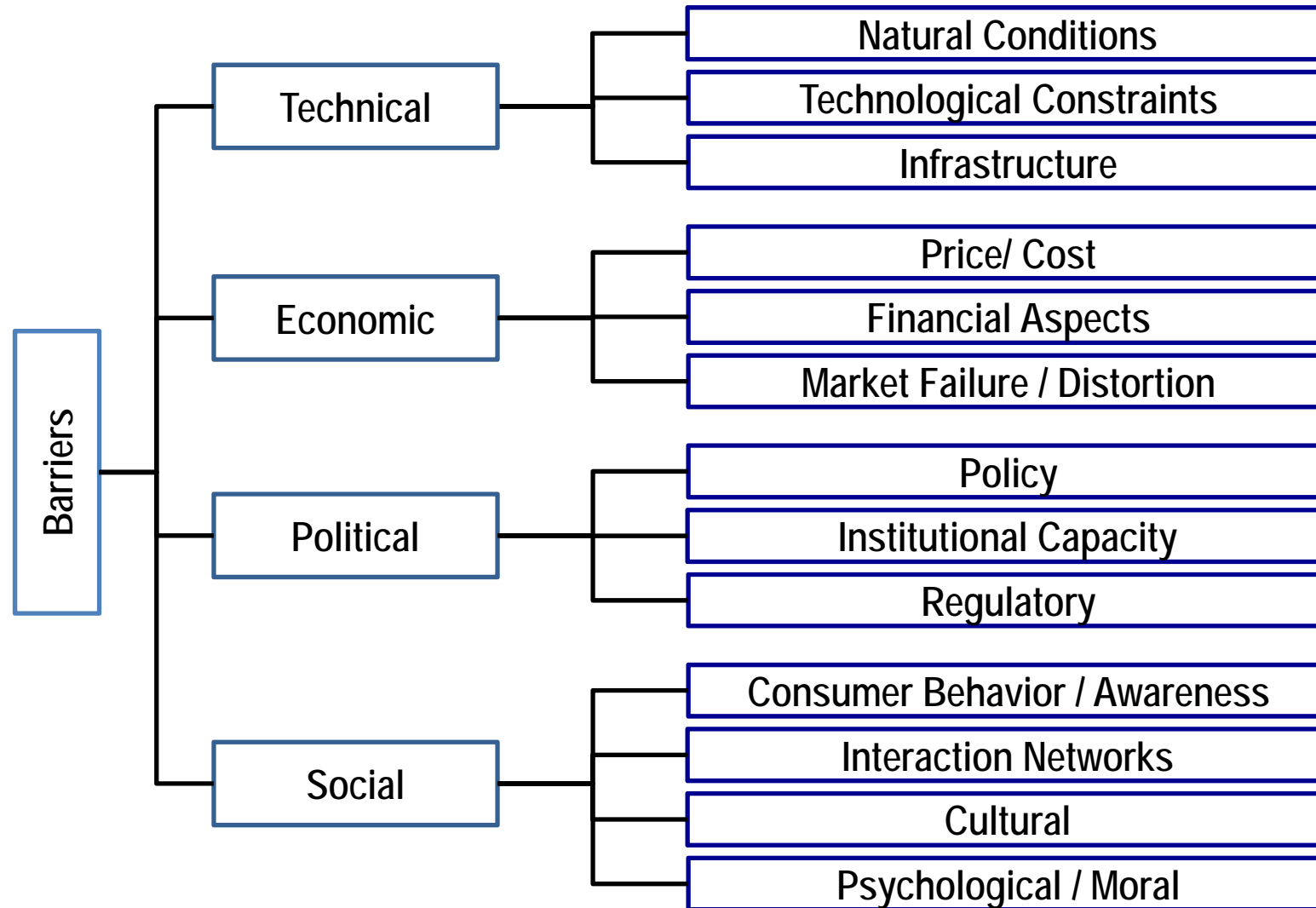
PV plant in Mustique and Wind
Turbines in Nevis

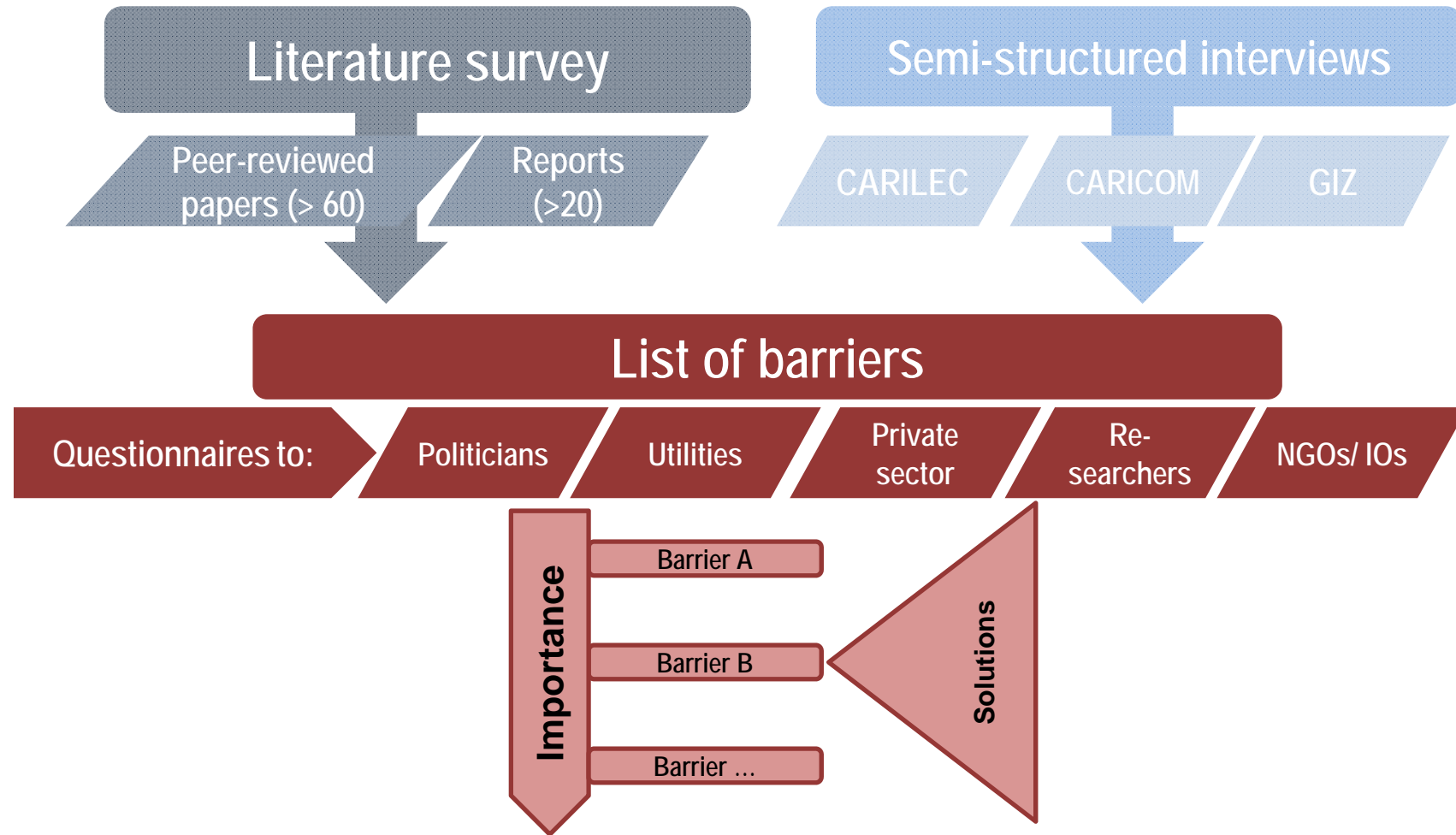


Source: Private



Results – List of Barriers

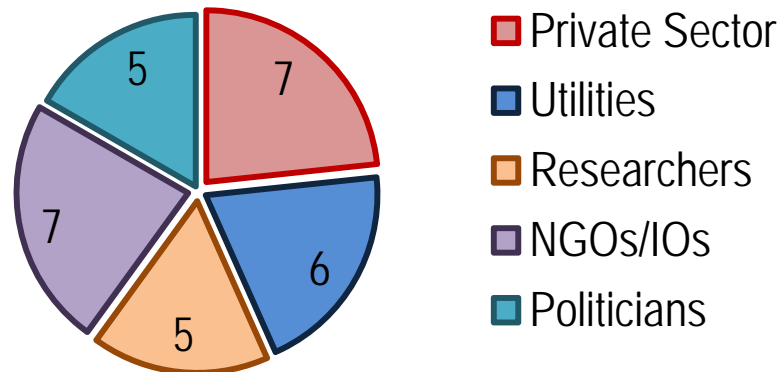




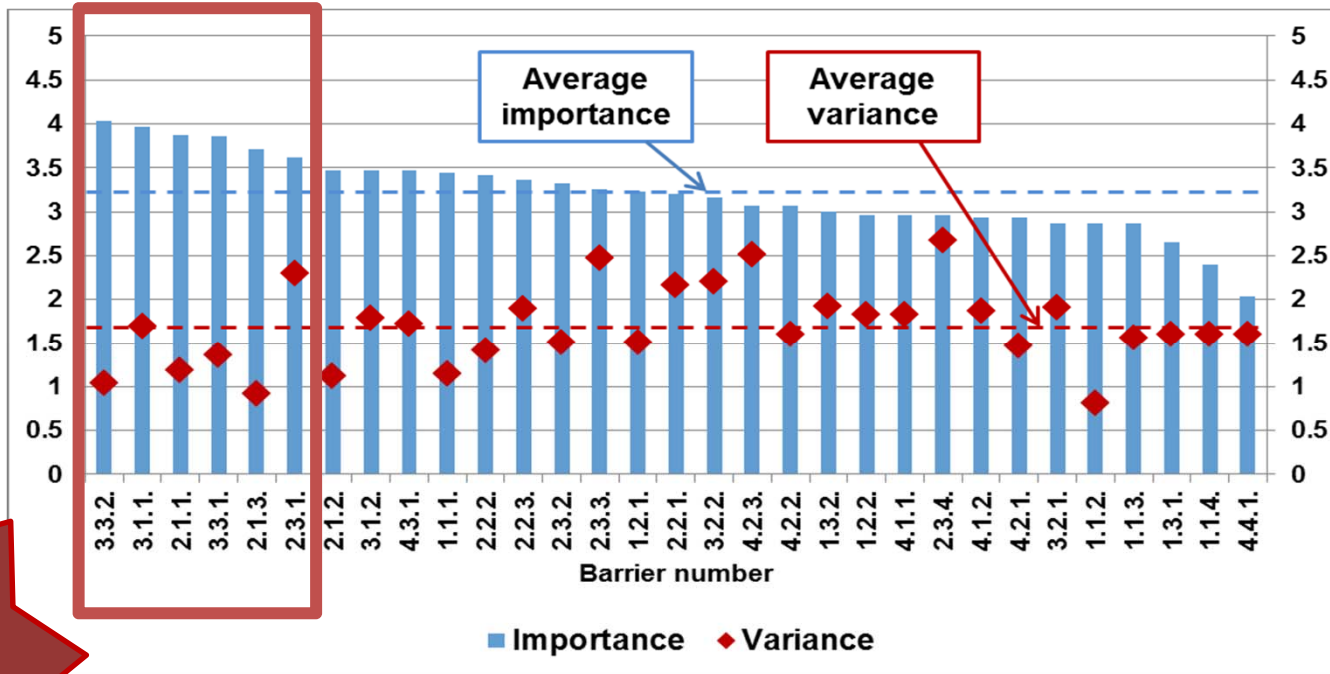
Questionnaire and Response Rate

5	4	3	2	1	0	Z
Highest importance	High importance	Moderate importance	Low importance	Very low importance	Absolutely no import.	Don't know

Response Rate: 30/100



Results Ranking – All stakeholders



6 most important barriers

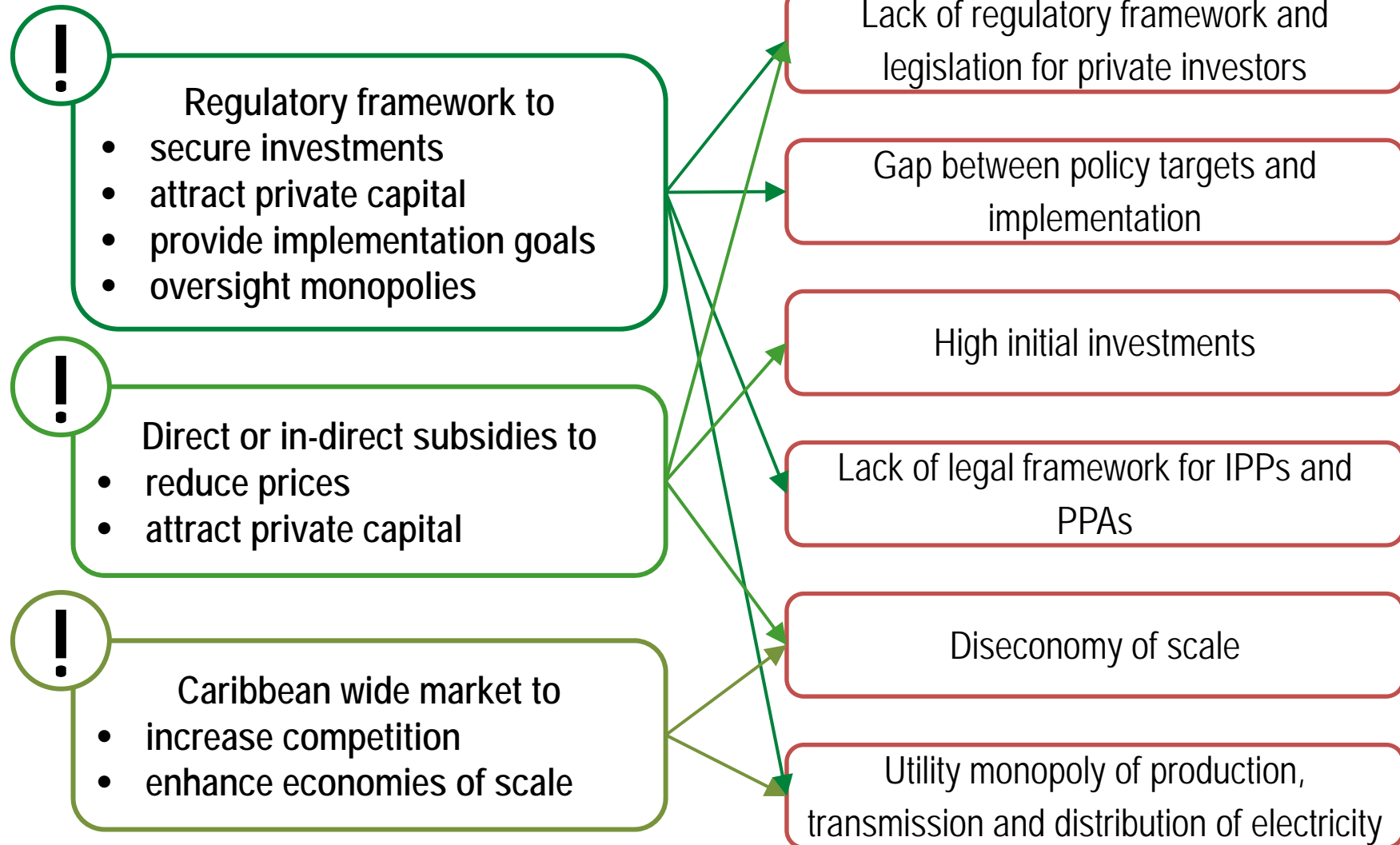
- 3.3.2. Lack of regulatory framework and legislation for private investors
- 3.1.1. Gap between policy targets and implementation
- 2.1.1. High initial investments
- 3.3.1. Lack of legal framework for IPPs and PPAs
- 2.1.3. Diseconomy of scale
- 2.3.1. Utility monopoly of production, transmission and distribution of electricity

Results Ranking – 6 Most Important Barriers

Barrier nr.	Barrier name	Imp. Overall	Var. Overall	Imp. Polit.	Imp. IOs	Imp. Private	Imp. Resear.	Imp. Utility
3.3.2.	Lack of regulatory framework and legislation for private investors	4.03	1.03	4.2	4.0	4.3	4.4	3.3
3.1.1.	Gap between policy targets and implementation	3.97	1.70	3.8	3.9	4.4	4	3.7
2.1.1.	High initial investments	3.87	1.18	4.4	3.9	3.7	4.2	3.3
3.3.1.	Lack of legal framework for IPPs and PPAs	3.86	1.36	4.2	4.3	4.0	4.2	2.7
2.1.3.	Diseconomy of scale	3.71	0.92	3.2	3.6	3.6	4.4	3.8
2.3.1.	Utility monopoly of production, transmission and distribution of electricity	3.62	2.30	3.8	4.1	4.2	4.2	1.8

- 3 Political, 3 Economic barriers
- Strong consensus for the top 5 barriers
- Rank 6 „Utility monopoly of production, transmission and distribution of electricity“ shows high variance => different reception among the different stakeholders

Recommendations



THANK YOU

... and the Reiner Lemoine-Stiftung for the kind support, which is greatly appreciated,
and my colleagues at the RLI for precious discussions.



I. Natural Conditions

- Land use competition on islands
- RE impact on landscapes and ecosystems
- Natural disasters
- Lack of evidence-based assessment of RE potentials

II. Technical Constraints

- Lack of technical expertise and experience
- Low availability of RE technologies

III. Infrastructure

- Inappropriate transport & installation facilities
- Unsuitable transmission system and grid stability issues with decentralised RE

I. Price/cost

- High initial investments
- High transaction costs
- Diseconomy of scale

II. Financial Aspects

- Lack of access to low cost capital or credit
- Lack of understanding of project cash flows from financial institutions
- Lack of private capital

III. Market Failure/distortion

- Utility monopoly of production, transmission and distribution of electricity
- Small market sizes
- Lock-in dilemma (conventional energy supply structures block REs)
- Fossil fuel subsidies and fuel surcharge

I. Policy

- Gap between policy targets and implementation
- Lack of incentives or subsidies for RE

II. Institutional Capacity

- Lack of formal institutions
- Lack of RE experts on governmental level

III. Regulatory

- Lack of legal framework for IPPs and PPAs
- Lack of regulatory framework and legislation for private investors

I. Consumer Behaviour/awareness

- Lack of social norms and awareness
- Lack of educational institutions

II. Interaction Networks

- Lack of RE initiatives
- Lack of local/national champions/ entrepreneurs
- Strong fossil fuel lobby

III. Cultural

- Dominance of cost over environmental issues

IV. Psychological/Moral

- Preference for status quo

RUI Results - Importance

Barrier nr.	Barrier name	Imp. Overall	Var. Overall	Imp. Polit.	Imp. IOs	Imp. Private	Imp. Research	Imp. Utility
3.3.2.	Lack of regulatory framework and legislation for private investors	4.03	1.03	4.2	4.0	4.3	4.4	3.3
3.1.1.	Gap between policy targets and implementation	3.97	1.70	3.8	3.9	4.4	4	3.7
2.1.1.	High initial investments	3.87	1.18	4.4	3.9	3.7	4.2	3.3
3.3.1.	Lack of legal framework for IPPs and PPAs	3.86	1.36	4.2	4.3	4.0	4.2	2.7
2.1.3.	Diseconomy of scale	3.71	0.92	3.2	3.6	3.6	4.4	3.8
2.3.1.	Utility monopoly of production, transmission and distribution of electricity	3.62	2.30	3.8	4.1	4.2	4.2	1.8
3.1.2.	High transaction costs	3.47	1.12	3.4	3.7	2.9	4.2	3.3
4.3.1.	Lack of incentives or subsidies for RE	3.47	1.78	3.4	3.7	3.9	3.4	2.8
2.1.2.	Dominance of cost over environmental issues	3.47	1.72	3.6	2.9	3.7	3.4	3.8
1.1.1.	Land use competition on islands	3.45	1.14	3.4	3.1	3.2	3.8	3.8
2.2.2.	Lack of understanding of project cash flows from financial institutions	3.41	1.41	4	3.3	3.7	4	2.2
2.2.3.	Lack of private capital	3.37	1.90	3.6	3.6	3.3	4	2.5
2.3.2.	Small market sizes	3.32	1.50	3.4	3.3	3.8	3.8	2.3
2.3.3.	Lock-in dilemma (conventional energy supply structures block REs)	3.25	2.47	3	4.0	3.7	4.2	1.5
1.2.1.	Lack of technical expertise and experience	3.23	1.51	3.8	3.4	3.0	4	2.2
2.2.1.	Lack of access to low cost capital or credit	3.21	2.16	2.6	3.8	3.6	3.2	2.7
3.2.2.	Lack of RE experts on governmental level	3.17	2.21	4.4	3.7	3.1	3	1.7
4.2.3.	Strong fossil fuel lobby	3.07	2.51	2.8	4.2	3.7	3.5	1.3
4.2.2.	Lack of local/national champions/ entrepreneurs	3.07	1.60	3.8	3.6	2.9	3	2.2
1.3.2.	Unsuitable transmission system and grid stability issues with decentralised RE	3.00	1.93	3.2	2.2	2.3	4.4	3.2
1.2.2.	Low availability of RE technologies	2.97	1.83	3.2	3.3	2.6	4	2.0
4.1.1.	Lack of social norms and awareness	2.97	1.83	3.8	3.6	3.3	2.4	1.7
2.3.4.	Fossil fuel subsidies and fuel surcharge	2.96	2.68	2.2	3.7	3.2	4.25	1.7
4.1.2.	Lack of educational institutions	2.93	1.86	3.6	3.7	3.1	2.4	1.7
4.2.1.	Lack of RE initiatives	2.93	1.46	3.4	3.3	3.0	2.6	2.3
3.2.1.	Lack of formal institutions	2.87	1.92	3.6	3.0	2.6	3.8	1.7
1.1.3.	RE impact on landscapes and ecosystems	2.86	0.81	2.8	2.7	3.3	2.4	3.0
1.1.2.	Natural disasters	2.86	1.57	3.2	2.4	2.8	3.2	2.8
1.3.1.	Inappropriate transport & installation facilities	2.66	1.61	3.2	2.6	1.7	3	3.0
1.1.4.	Lack of evidence-based assessment of RE potentials	2.39	1.60	2.4	2.2	2.9	2.6	1.8
4.4.1.	Preference for status quo	2.04	1.61	1.8	2.7	2.0	1.6	1.0