



Renewable Energy Technology Road-mapping

Assessment of Renewable Energy Technologies using Multi-Criteria Decision-Analysis

Sri Lanka
Sustainable Energy Authority

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RENEWABLE ENERGY EXPLORATION

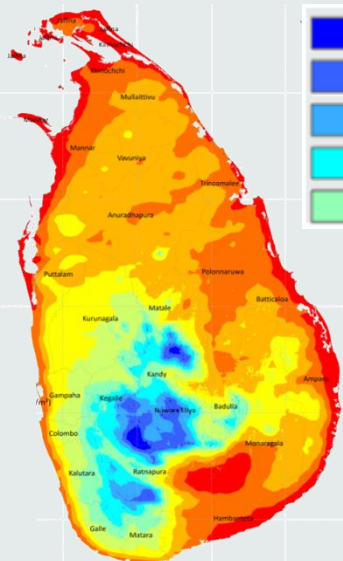
The Strategic Approach



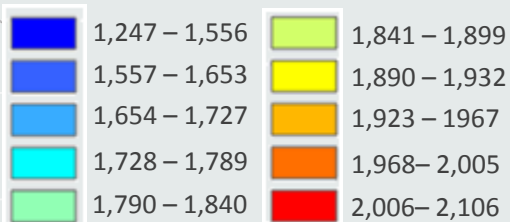
RENEWABLE ENERGY RESOURCES

- Resource Maps

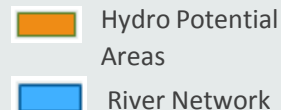
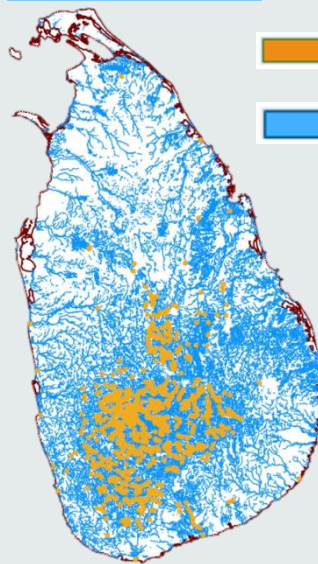
Solar



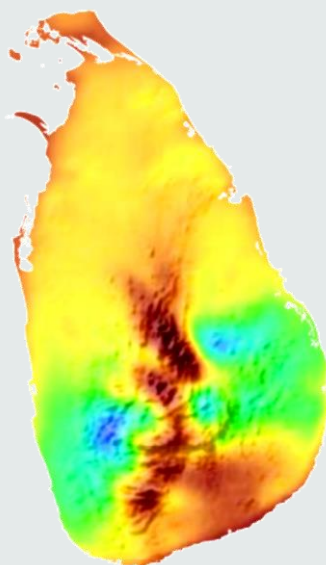
(kWh/m²/yr)



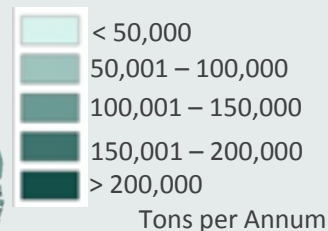
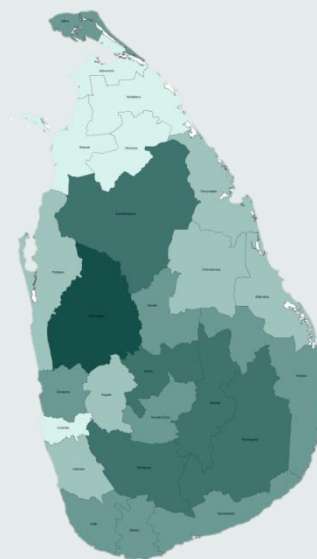
Hydro



Wind



Biomass – Dendro Plantations

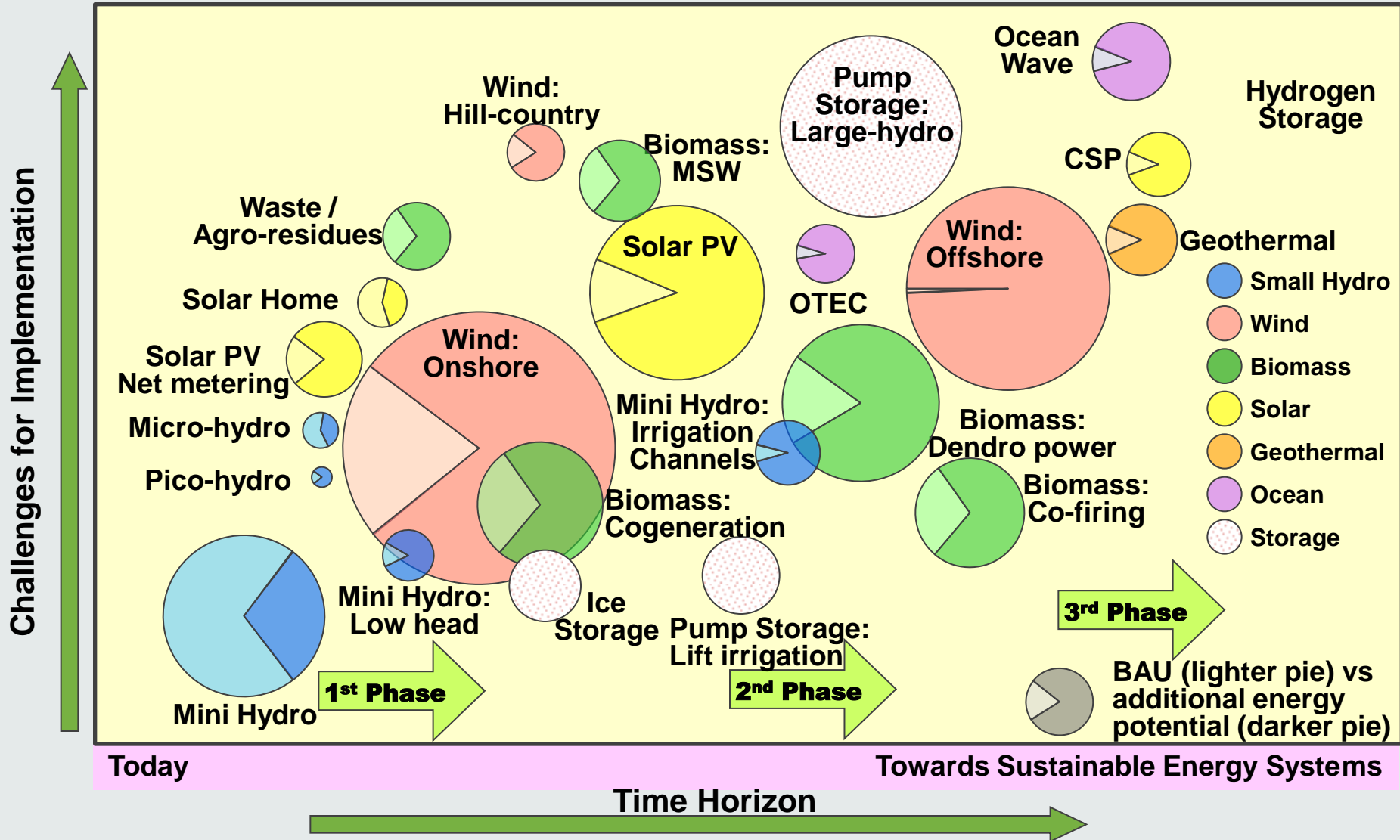


Sources : NREL and SLSEA Resource Maps

RENEWABLE ENERGY RESOURCES

• Technology Road-Mapping – The Concept

2050+ 

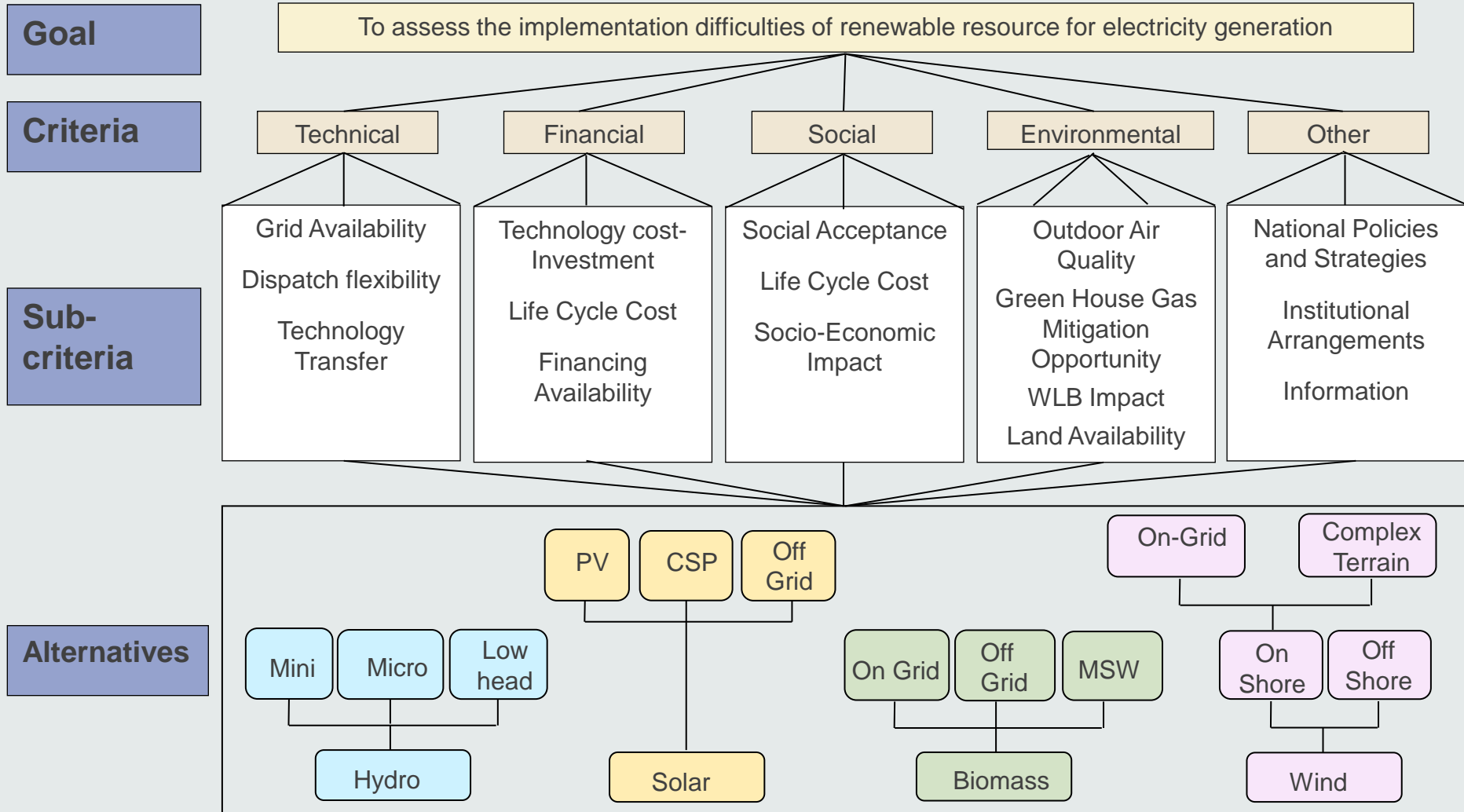


RESOURCE-TECHNOLOGY-OPTIONS PRIORITIZATION

- Evaluation of RE **resource-technology- options** in terms of implementation difficulty and planning period
- Prioritization based on the Multi-Criteria Decision-Analysis (MCDA)
 - a. Analytical Hierarchical Process (AHP)
 - &
 - b. Weighted Sum Matrix (WSM)

a. ANALYTICAL HIERARCHICAL PROCESS (AHP)

1. Problem Decomposition



a. ANALYTICAL HIERARCHICAL PROCESS cont..

2. Comparative analysis

- Pair wise comparison of sustainability criteria

3. Computation of Priority Values

b. WEIGHTED SUM MATRIX MODEL

- Evaluate Technology Options

ILLUSTRATION EXAMPLE : GRAPHICAL REPRESENTATION

Prioritization of RE resource-technology-options

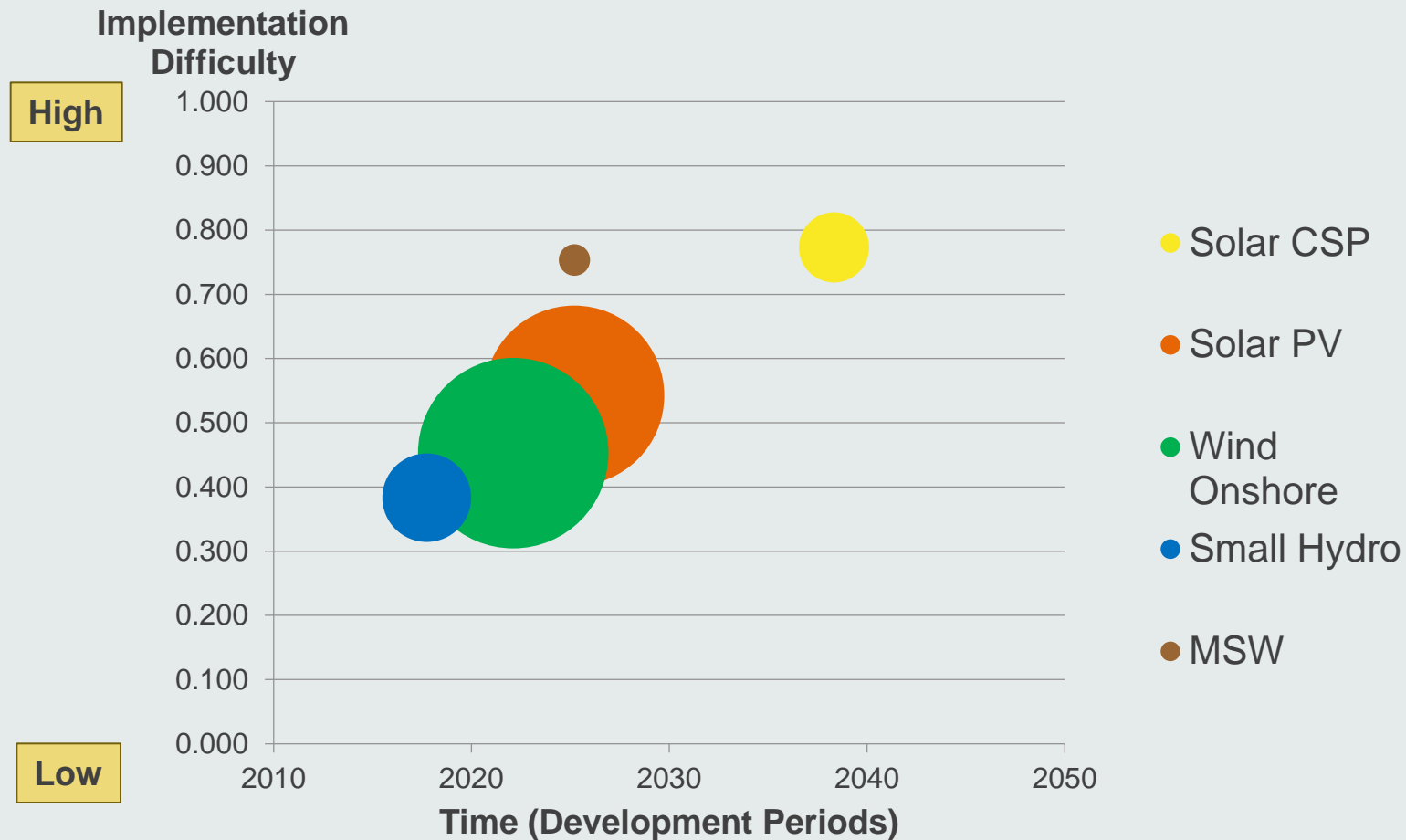
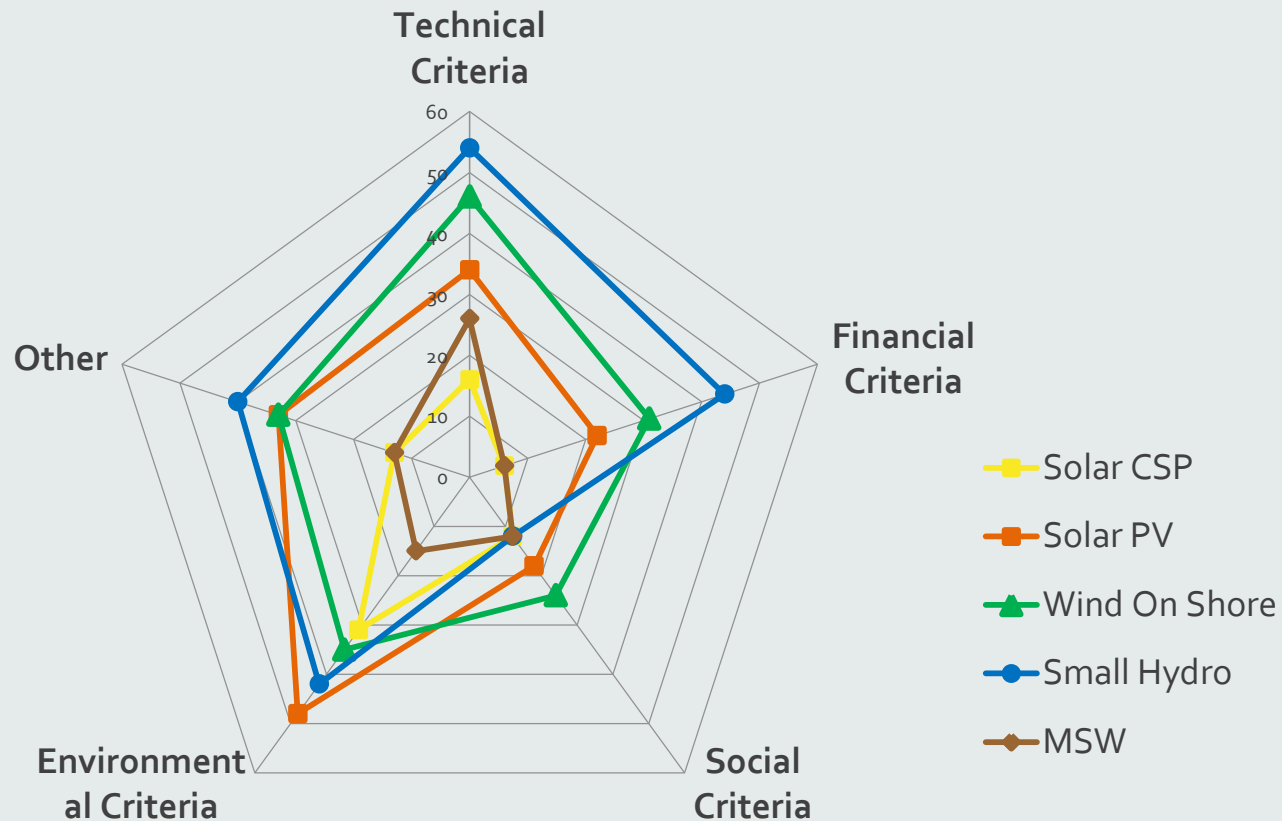


ILLUSTRATION EXAMPLE : CRITERIA-WISE PERFORMANCE

Performance of selected technology applications with respect to criteria



DISCUSSION

- Effective tool for policy makers and planners
- Comprehensive understanding about the RE resource-tech-applications is required
- Should be supported by data/literature information
- Difficulty of selecting mutually independent sub criteria for two axis (Implementation difficulty & Deployment period)
- Importance of engagement of stakeholders throughout this process
- Monitoring and evaluating mechanism, feedback for continuous improvement

ACKNOWLEDGEMENTS FOR THE ORGANIZERS OF ACEF 2015

Thank you..

Computation of Priority Values

	Technical	Financial	Social	Environmental	Other	Normalized Eigen Vectors
Technical	1.00	2.00	3.00	4.00	5.00	0.429
Financial	0.50	1.00	2.00	2.00	3.00	0.236
Social	0.33	0.50	1.00	1/2	3.00	0.125
Environmental	0.25	0.50	2.0	1.00	2.00	0.143
Other	0.20	0.33	0.33	0.50	1.00	0.067

Normalized Eigen Vectors
0.2
0.2
0.2
0.2
0.2

↑
Weights of sustainable criteria

↑
Equally distribution of Weights



WEIGHTED SUM MATRIX MODEL

