

Introduction to Online Portal and Capacity Building Tool

National Expert SDG Tool for Energy Planning

Virtual Workshop on
Stakeholder Consultation and Capacity Building on the National Expert SDG Tool
for Energy Planning (NEXSTEP) for the SDG 7 Roadmap for Armenia

ESCAP

13 May 2024



Agenda

- Introduction to NEXSTEP Web Tool
 - Tool layout & components
 - Viewing component results and performing analyses
 - User accessibility and maintenance
- Web Tool Practical Walk-Through
- Capacity building with NEXSTEP e-Learning module



Main Components



ENERGY MODELING

Energy and emissions modelling will help estimate the share of different energy resources, and identify the technological interventions needed to achieve those shares.

ENERGY MODELING

ECONOMIC ANALYSIS

Economic analysis to identify the economically feasible options/interventions.

ECONOMIC ANALYSIS

SCENARIO ANALYSIS

Scenario analysis to determine/identify the policies that are feasible for implementation in the national context.

SCENARIO ANALYSIS

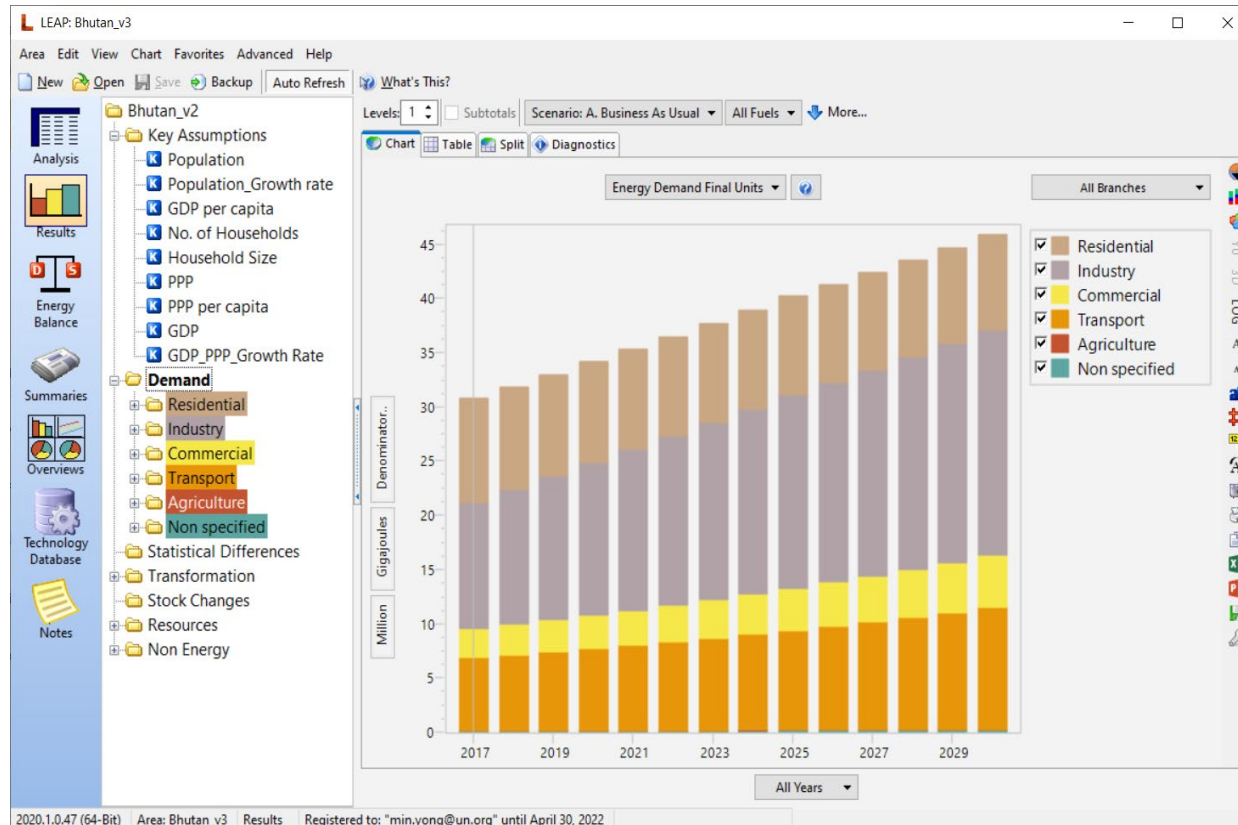
Technology Database

Technology Database allows users to estimate the Economic, Social, and Environmental impacts of different technologies.

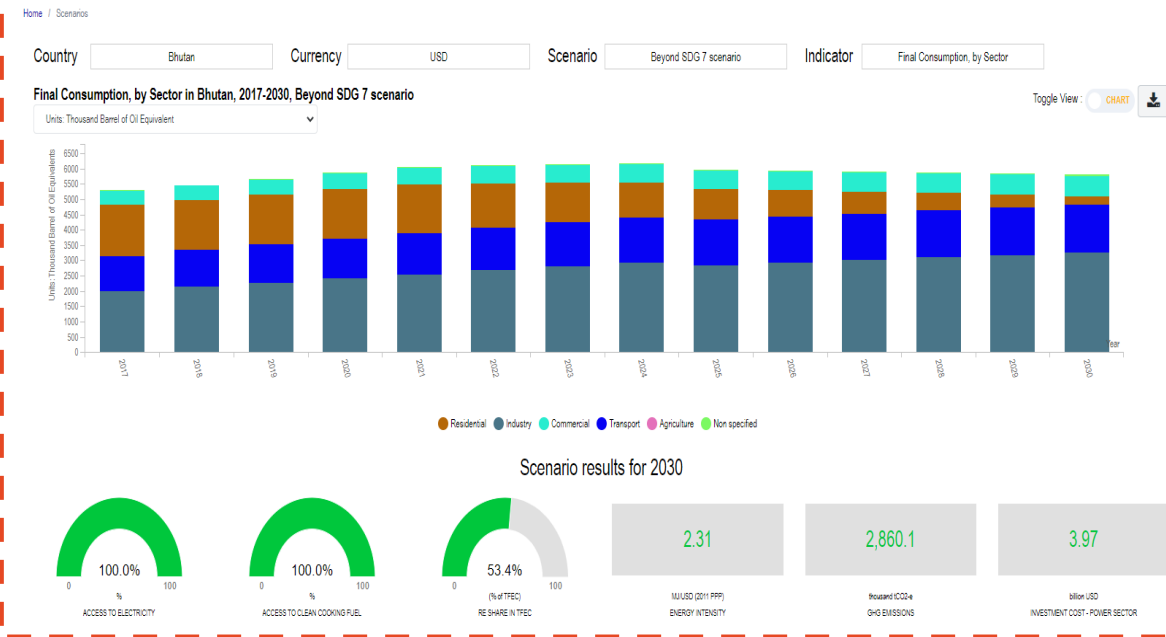
TECHNOLOGY DATABASE

Component 1: Energy Modelling

Data Collection → Energy Modelling



Results Visualisation on Web Tool



Component 1: Energy Modelling

Toggle between scenarios ...



Component 1: Energy Modelling

... and indicators.

azaman

Scenarios Indicators

Home / Scenarios

Country:
 Currency:
 Scenario:
 Indicator:

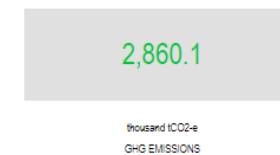
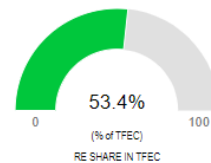
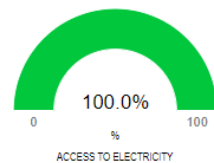
Final Consumption, by Sector in Bhutan, 2017-2030, Beyond SDG 7 scenario
Toggle View: TABLE

Units: Thousand Barrel of Oil Equivalent

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Residential	1,659.5	1,629.2	1,616.5	1,604	1,591.7	1,447.5	1,306.7	1,164.3	1,017.2	869.9	722.3	574.4	426.3	277.9
Industry	1,993.7	2,133.9	2,274.7	2,416.2	2,545.9	2,676.3	2,804.8	2,933.8	2,844.7	2,926.3	3,008.7	3,091.8	3,175.6	3,260.3
Commercial	463.8	476.3	499.1	521.9	545.7	571.8	580.5	590	600.3	611.4	623.4	636.3	650.3	665.2
Transport	1,154.1	1,201.2	1,249.6	1,300.1	1,352.6	1,403	1,433.1	1,459.8	1,483.3	1,503.5	1,520.5	1,533.4	1,547.2	1,563
Agriculture	1.4	1.5	1.5	1.6	1.7	1.8	1.8	1.9	2	2.1	2.2	2.3	2.4	2.5
Non specified	18.7	19.5	20.4	21.4	22.4	23.4	24.5	25.6	26.8	28	29.3	30.7	32.1	33.6
Total	5,291.2	5,461.6	5,661.8	5,865.2	6,060	6,123.8	6,151.4	6,175.4	5,974.3	5,941.2	5,906.4	5,868.9	5,833.9	5,802.5

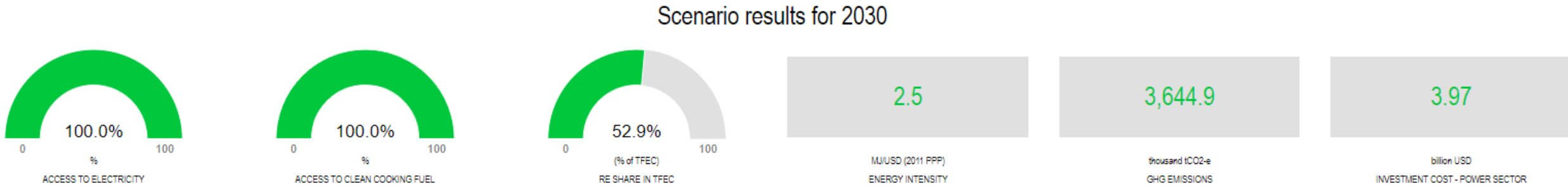
Showing 1 to 6 of 6 rows rows per page

Scenario results for 2030



Component 1: Energy Modelling

Tracking progress towards SDG 7 and NDC



Results for SDG Scenario

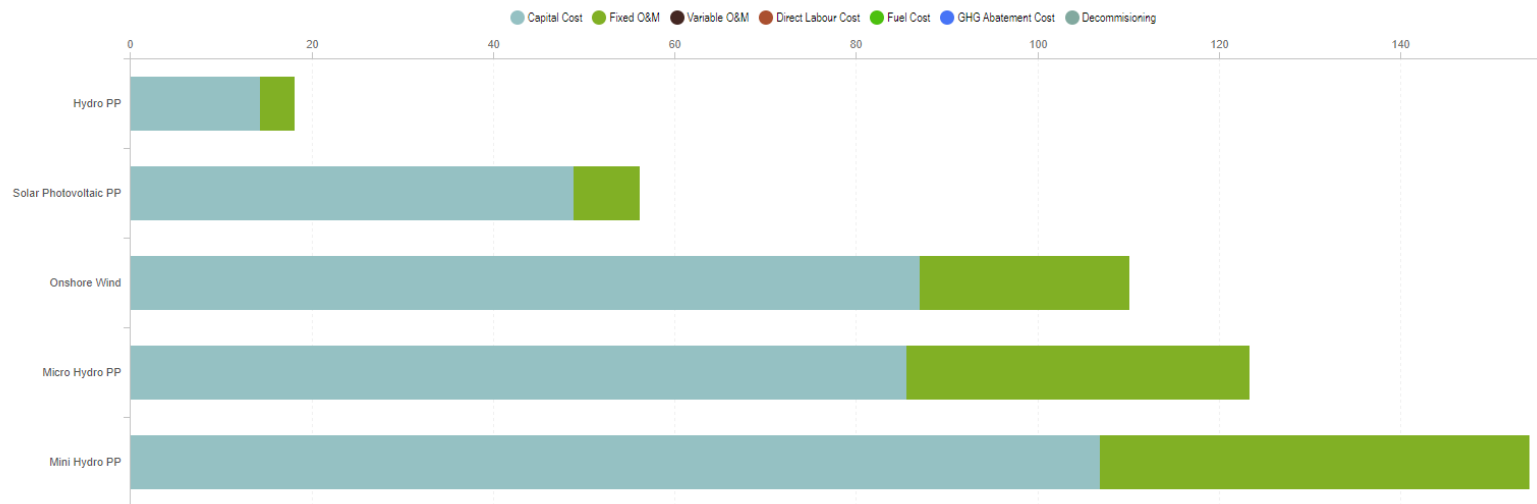
Component 2: Economic Analysis

Economic Analysis for Power Technologies (LCOE) and Clean Cooking Technologies (annualised cost)

Country Currency

Economic Analysis For Bhutan

LCOE Component Analysis (USD/MWH), Power Plant Technologies



Technologies	Annualized Cost
LPG Stove	147.3
Biogas Digester	131.33
Electric Stove	37.23
ICS	39.9

Results provided in both chart and table format

Component 2: Economic Analysis

Data Input for Economic Analysis

Data Input for:

- Basic Parameters (i.e. carbon price, electricity tariff)
- Fuel Prices
- Technological Parameters (i.e. capacity factor, efficiency, CAPEX)

Standalone module

Technology level	Solar Photovoltaic PP fields	
<input type="checkbox"/> Heavy Fuel Oil PP	Capacity Factor	14 14 %
<input type="checkbox"/> Diesel Fuel PP	CAPEX/MW	883000 883000 USD
<input type="checkbox"/> Combined Cycle Gas Turbine	Decommissioning Cost	0 0 % of CAPEX
<input type="checkbox"/> Single Cycle Gas Turbine	Fixed O&M	9000 9000 USD/MW-year
<input type="checkbox"/> Gas Engine	Labour	0 0 % of CAPEX
<input checked="" type="checkbox"/> Solar Photovoltaic PP	Lifetime	30 30 years
<input type="checkbox"/> Solar Photovoltaic PP w/ Battery Storage	Load Factor	1 1 N/A
<input type="checkbox"/> Concentrated Solar Power (CSP) w/ TES	Salvage Value	0 0 % of CAPEX
<input checked="" type="checkbox"/> Onshore Wind	Variable O&M	0 0 USD/MWh
<input type="checkbox"/> Offshore Wind		
<input type="checkbox"/> Biomass PP		
<input type="checkbox"/> Biofuel PP		
<input checked="" type="checkbox"/> Hydro PP		
<input checked="" type="checkbox"/> Mini Hydro PP		
<input checked="" type="checkbox"/> Micro Hydro PP		

Component 3: Scenario Analysis

Ranking of scenarios based on 12 criteria

i.e. emissions, investment costs, SDG 7 targets achievement

Users are allowed to make changes to the weightage of the criteria

Energy Modeling	Criteria		
Scenarios Analysis	Criterion	Value Preferred	Weight(%)
Economic Analysis	Investment Cost	Low	15
Roadmap	Access to clean cooking fuel	High	10
Technology	Energy efficiency	Low	10
Input Template Detail	Share of RE	High	10
LEAP Output Detail	Emissions in 2030	Low	10
LEAP Targets Achieved	Alignment with PA	High	9
Currency Settings	Price on carbon	High	3
	Fossil fuel phased out	High	3
	Fossil fuel subsidy phased out	High	5
	Cost of access to electricity	Low	5
	Cost of access to clean cooking fuel	Low	5

Home / Scenarios Analysis

Country Sample Country Currency

Scenario Analysis For Fiji

Scenario	Weighted Score	Rank
Enhanced NDC through Power Sector Decarbonisation and Sustainable Transport	64	1
Decarbonisation of Power Sector Scenario	55.6	2
Sustainable Transport Scenario	53.7	3
SDG Scenario	45.6	4
Current Policy Scenario	26.2	5
BAU Scenario	15	6

Showing 1 to 6 of 6 rows

Work in Progress

Policy Recommendations

Scenarios × Indicators × Home / Scenarios

COUNTRY: ABC

Scenario : Enhancing NDC with phasing out coal and FF subsidy (Medium) Toggle View : CHART

Energy efficiency

City **prove energy efficiency to 2.57 MJ/USD by 2030**

City a can accelerate energy efficiency gains beyond SDG 7.3 target. This can be achieved by a range of energy efficiency measures to achieve a reduction of 139 million BOE:

1. Introduce MEPS for all new lights from 2022 onwards to reduce CFL 14W to LED 5W, this will save 28.6 million BOE annually.
2. Convert 50% of passenger buses to electric buses by 2030, this will save 20.5 million BOE annually.
3. Convert 50% of passenger cars to electric cars by 2030, this will save 15.4 million BOE annually.
4. Change the wet-process of clinker production in the cement industry to pre-heated process using pre-calciner kilns, this will save 13.7 million BOE annually.
5. Introduce MEPS for all new air-conditioners from 2022 onwards, this will save 9.9 million BOE annually.
6. Improve fuel economy standards by 20% for all heavy duty vehicles from 2022 onwards, this will save 9.4 million BOE annually.
7. Introduce MEPS for all new televisions from 2022 onwards, this will save 8.4 million BOE annually.
8. Introduce MEPS for all new refrigerators from 2022 onwards, this will save 7.6 million BOE annually.
9. Introduce MEPS for all new electric fans from 2022 onwards, this will save 1.6 million BOE annually.

Example

Roadmap

Energy Modeling Scenarios Analysis Economic Analysis Roadmap Technology Input Template Detail LEAP Output Detail LEAP Targets Achieved

Home / Roadmap Detail

Country Roadmap for

National SDG 7 Roadmap

Pakistan

Developed using National Expert SDG7 Tool for Energy Planning (NEXSTEP)

June 2020

[Nunc at tempor purus »](#)

Summary for Policymakers

Georgia progress towards achieving the SDG7 targets is promising but not enough. Without a concerted effort and enabling policy framework, the country is unlikely to achieve all targets. The current level of effort in access to clean cooking fuel will need to increase by about three-fold with focus given in the promotion of electric cookstove to connect the remaining 56 million people by 2030. The current plan for 1 per cent annual improvement in final energy intensity will need to be revised to 1.53 per cent to achieve primary energy intensity target of 2.39 MJ/USD by 2030. The current trend indicates that the country will fail to achieve its 2025 renewable energy target as well as the emission reduction target related under the Paris Agreement. The share of renewable energy will need to increase to 21 per cent of the total final

Example



Conclusion

NEXSTEP web tool :

- Informs about scenario results visualisation
- Provides cost analysis for power and clean cooking technologies
- Enables prioritisation of scenarios to inform future policies
- Provides consolidation of policy recommendations and roadmap



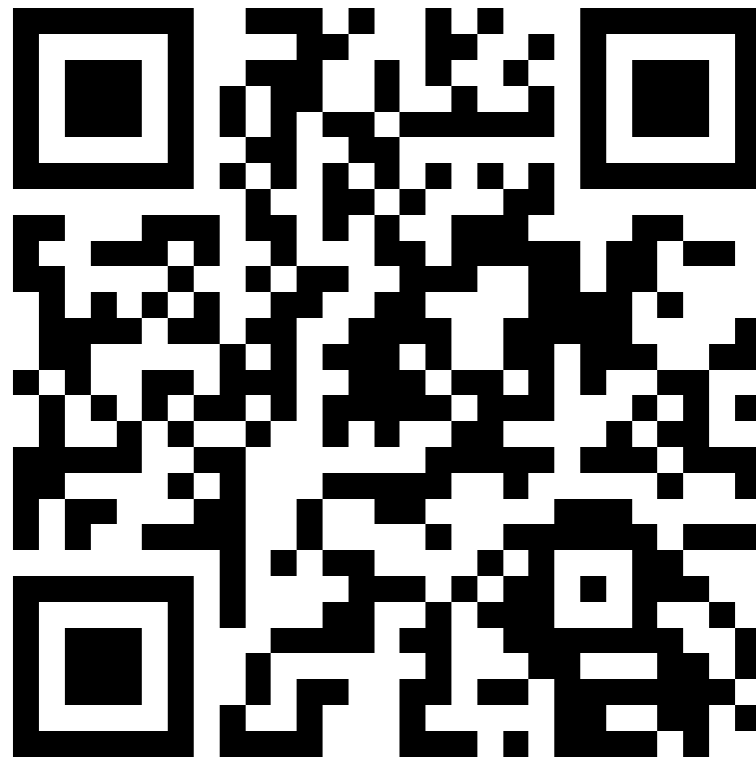
Web Tool Practical Walk-Through

<https://nexstepenergy.org/>



Workshop valuation

<https://forms.office.com/r/FqwDZJCjW1>



Multi-Criteria Decision Analysis (MCDA) in NEXSTEP

- NEXSTEP applies MCDA to rank scenarios based on the country-specific priorities.
 - To identify which scenario is more important than others and thus prioritizing policy measures
 - To support policymakers in making informed policy decisions by learning economic, social and environmental priorities at local, national and international levels.

The criteria development and weighting is best done in a stakeholder consultation workshop. If deemed necessary, this step can be repeated using the NEXSTEP tool in consultation amongst stakeholders where the participants may want to change weights of each criterion.



How is MCDA used in NEXSTEP?

- The NEXSTEP analysis evaluates scenarios and ranks using the Multi Criteria Decision Analysis (MCDA) tool based on a set of 12 criteria and weights assigned to each criterion.

The screenshot displays the NEXSTEP interface for scenario analysis. On the left, a 'Criteria' panel lists 12 criteria with their preferred values and weights. On the right, the 'Scenario Analysis For Indonesia' results are shown in a table, sorted by weighted score and rank.

Criterion	Value Preferred	Weight(%)
Investment Cost	Low	15
Access to clean cooking fuel	High	10
Energy efficiency	Low	10
Share of RE	High	10
Emissions in 2030	Low	10
Alignment with PA	High	9
Price on carbon	High	3
Fossil fuel phased out	High	3
Fossil fuel subsidy phased out	High	5
Cost of access to electricity	Low	5
Cost of access to clean cooking fuel	Low	5
Net benefit from power sector	High	15

Scenario	Weighted Score	Rank
Enhancing NDC with phasing out coal and FF subsidy	60.7	1
No new investment in coal-fired power plants	58.9	2
Enhancing NDC with phasing out NG and FF subsidy	57	3
Reduced fossil fuel subsidy with low carbon price	56.3	4
Reduced fossil fuel subsidy with high carbon price	56	5
Enhancing NDC by decarbonizing power sector	51	6
Conditional NDC with high energy efficiency	49.1	7
SDG Scenario	48.3	8
Current Policy Scenario	27.8	9
Business As Usual	19.7	10



Setting weight of each criterion

- Please go to **www.menti.com** and use the code **3149 7454**
- Users/stakeholders to allocate weights in terms of relative importance of each criterion.
- If a criterion is believed to be not applicable, allocation should be zero
- The total weight needs to be 100 per cent.
- Click submit when done

- The value from each participant will be aggregated automatically



Allocate weights in terms of the relative importance of each criterion. You can put any value

Investment Cost

-10 +10

0 points left

Access to clean cooking fuel

-10 +10

0 points left

Energy efficiency

-10 +10

0 points left

Share of Renewable Energy

-10 +10

0 points left

Emissions in 2030

-10 +10

0 points left

Alignment with Paris Agreement

-10 +10

0 points left

Price on carbon

-10 +10

0 points left

Fossil fuel phased out

-10 +10

0 points left

Fossil fuel subsidy phased out

-10 +10

0 points left

Cost of access to electricity

-10 +10

0 points left

Cost of access to clean cooking fuel

-10 +10

0 points left

Net benefit from power sector

-10 +10

0 points left

Set zero if you think it is not important/applicable



Total value must be 100 (you can see how many point left)