



Congo Micro Grid Feasibility Discussion Forum #2



Record of Discussion

These design briefs developed within communities will contribute to SuRF project Milestone 5.4 High level concept and design for the eight communities

CONGO PLAYGROUND PARK

11 MAY 2023

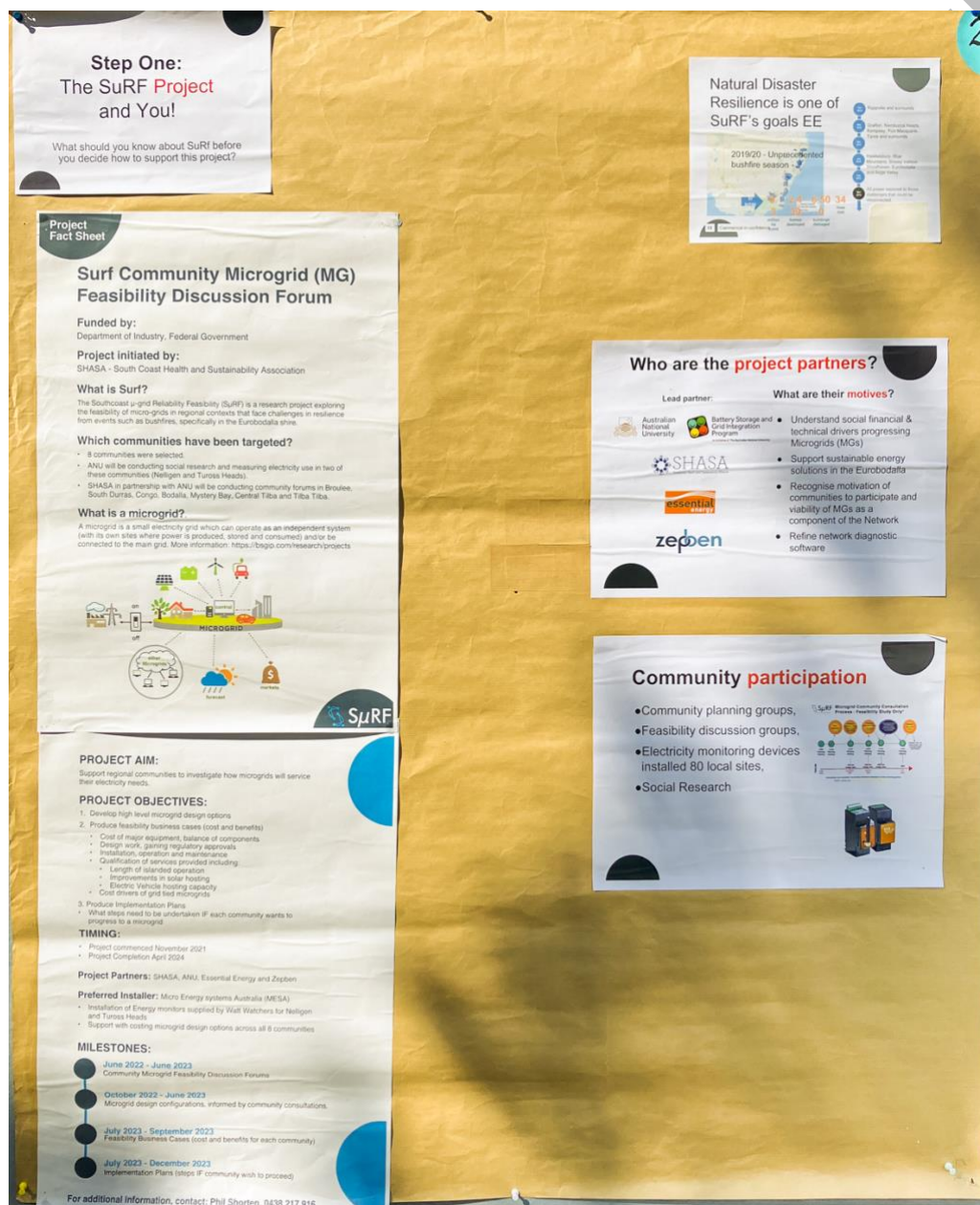
*Presented by Hedda Ranson-Cooper & Bjorn Sturmberg (ANU), Warwick Crowfoot & Matt O'Neill (Essential Energy) and Matt O'Regan (ITP).
Moderated by Phil Shorten (SHASA)*

Introduction and Context

The first step of the forum was to introduce the purpose and process of the forum and recognise the group participating in the discussion.

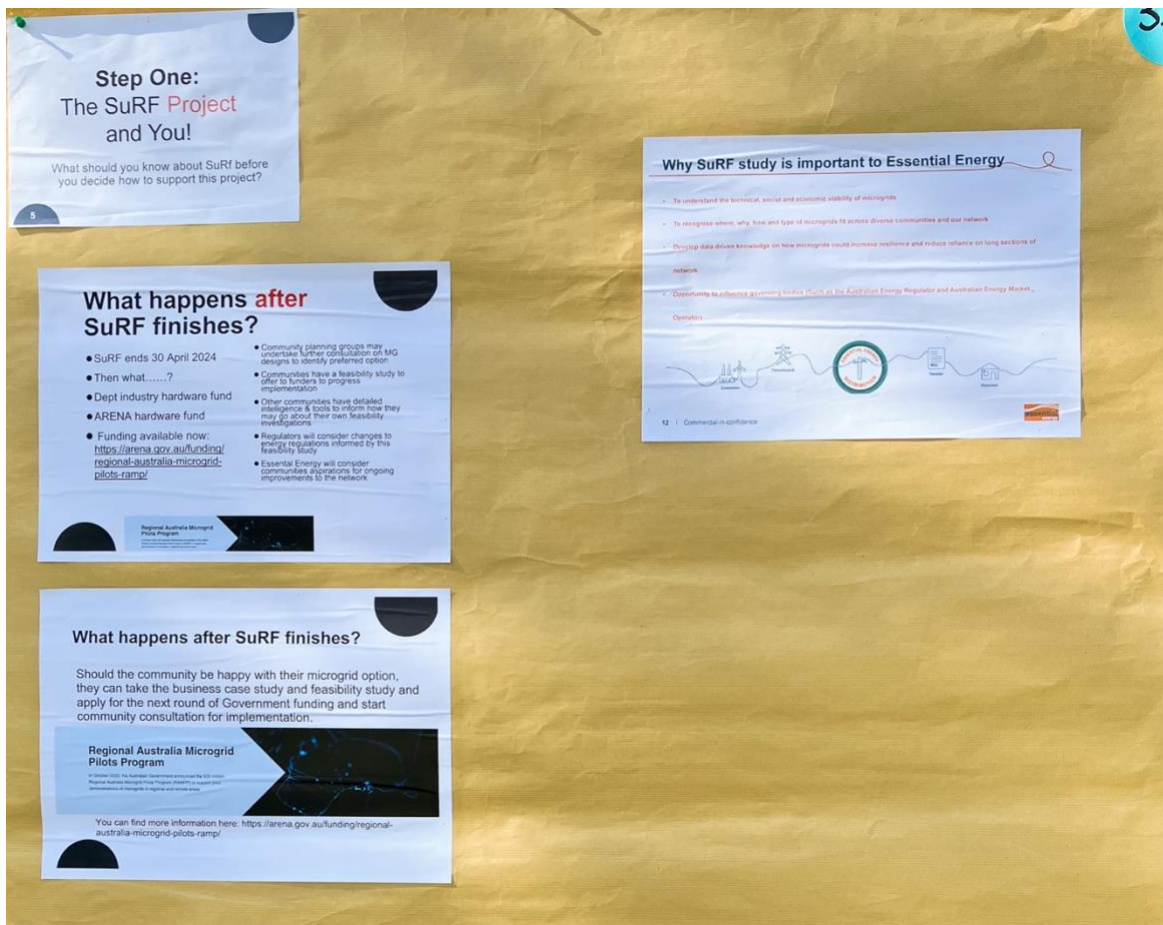
The purpose being to provide information on the context and status of the SuRF Microgrid feasibility study so that those participating leave with a deeper understanding of Microgrids and have a chance to comment on the different aspects of design that are important to them.

The context was provided by way of a series of project fact sheets about the SuRF project.



Moderator Notes...

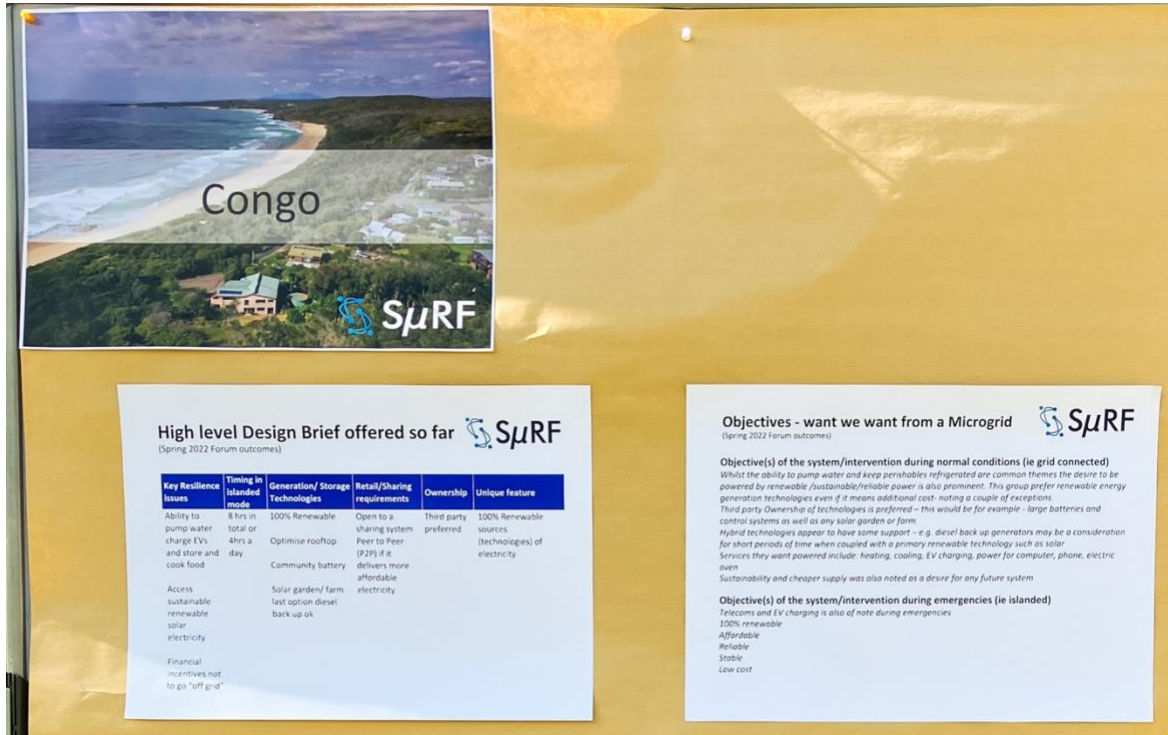
Introduction and Context



Moderator Notes...

STEP 1

Design Objectives from Round 1 Community Discussion Group



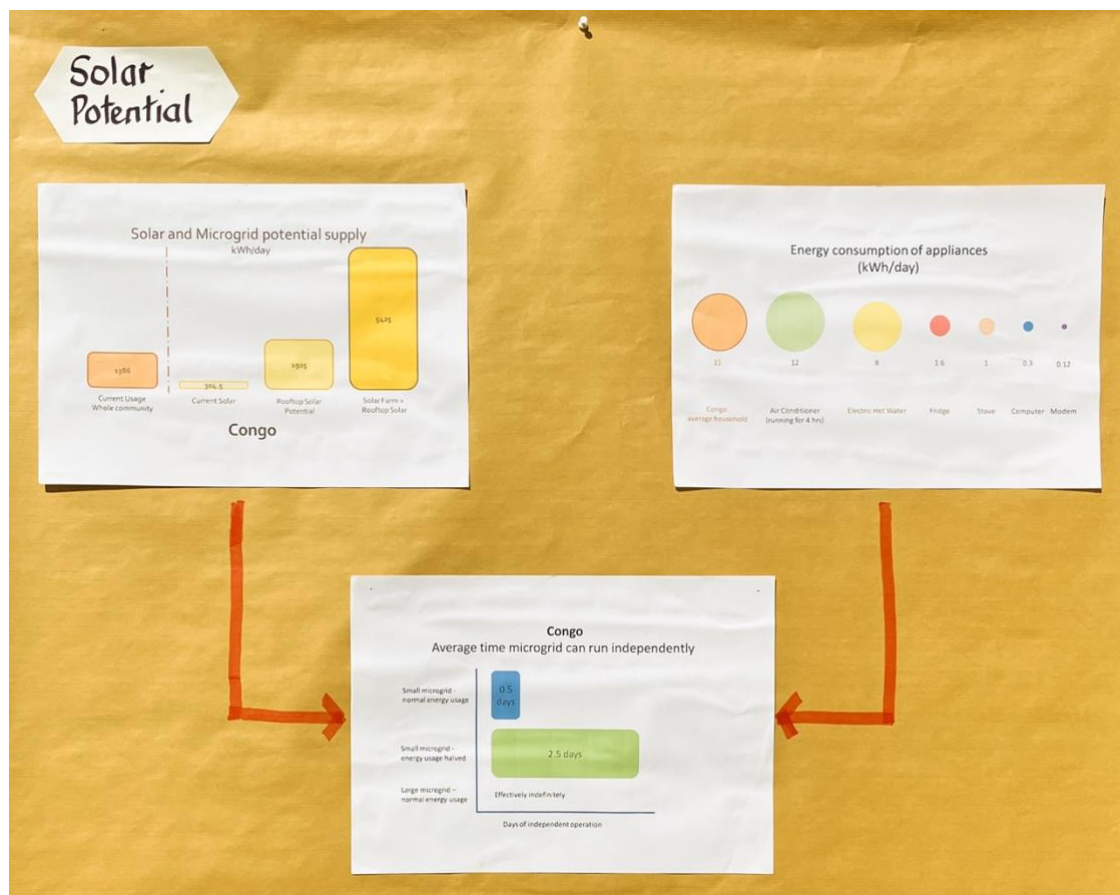
Moderator Notes...

FEASIBILITY

STEP 2

Analysis of solar potential within the community

Analysis showing the potential generation available from rooftop solar and the time the microgrid could operate in islanded mode.



Moderator Notes...

The analysis suggests that battery offered in the microgrid design by the SuRF team will provide almost half (0.5) a day of electricity in islanded (switched off from main) during a main grid outage.


If the community was to restrict their usage by 50% then the islanded time could be extended to 2.5 days.

STEP 3

Small Microgrid: Design brief offered from Rd 1 community discussion group


The design brief was informed by the outcomes from the Round 1 consultations held during the Spring of 2022.

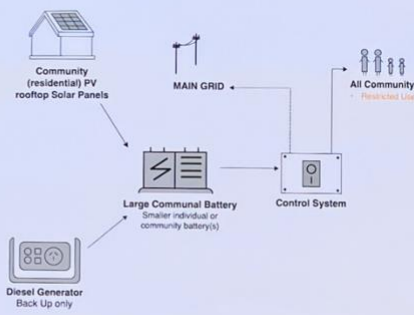
Small Microgrid



Congo SMALL Type 2 MG Mudmap

(from Rd 1 discussions held Spring 2022)





Congo SMALL Type 2 MG Guidelines

(from Rd 1 discussions held Spring 2022)

- Ensure all community served at same level → Needs to be fair/equitable in cost and benefit
- Simple
- Low maintenance
- Reliable
- No demand on community resources
- If at house scale needs to have positive impact on property and value
- Everyone gets 4 hours of sufficient power to cover high pressure pump/flow for fire fighting from communal battery
- Needs to have low or no cost to community – part of energy supplier service

(Copyright from Research Forum Rd 1 documents)

Congo SMALL Type 2 MG Guidelines

(from Rd 1 discussions held Spring 2022)

- Credit for existing/future installed infrastructure
- If communal battery – need to make sure power shared evenly in an emergency
- Emergency system
- Cost effective/no cost

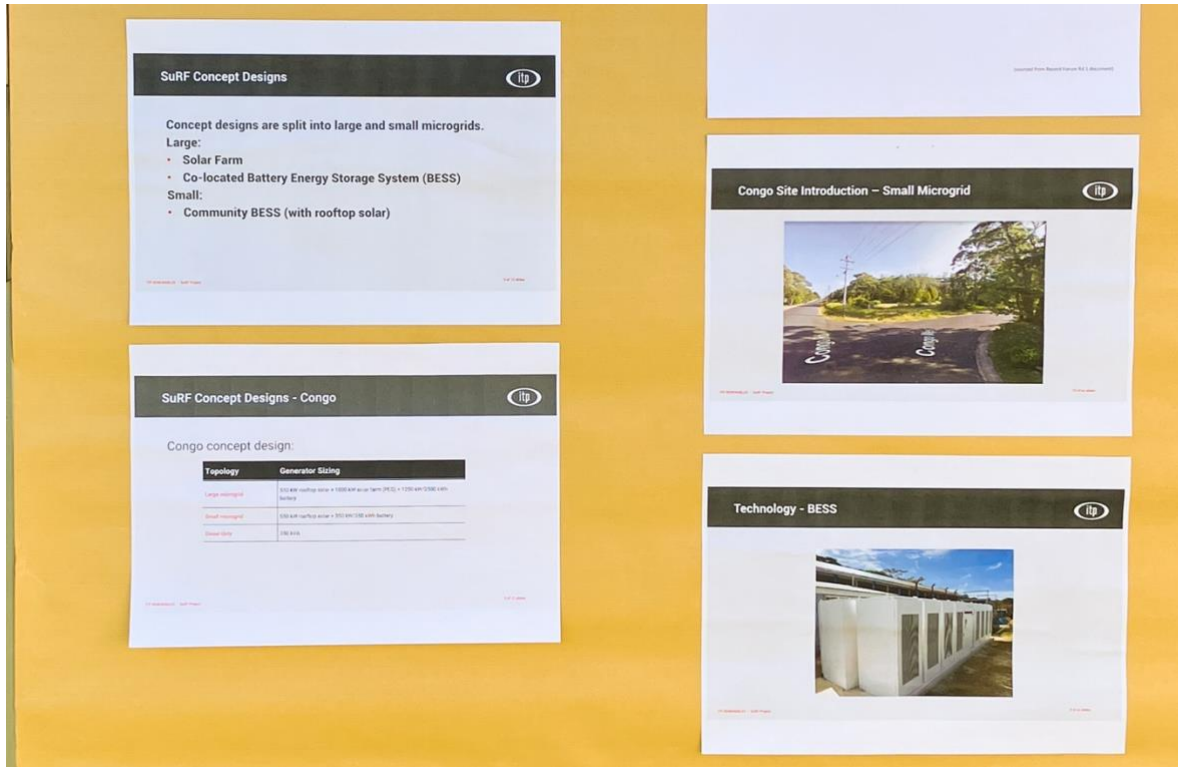
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Moderator Notes...

STEP 3

Small Microgrid: High Level Design Concept

Technologies with technical specifications and costings compiled by the SuRF team for the small Microgrid were made available for comment.



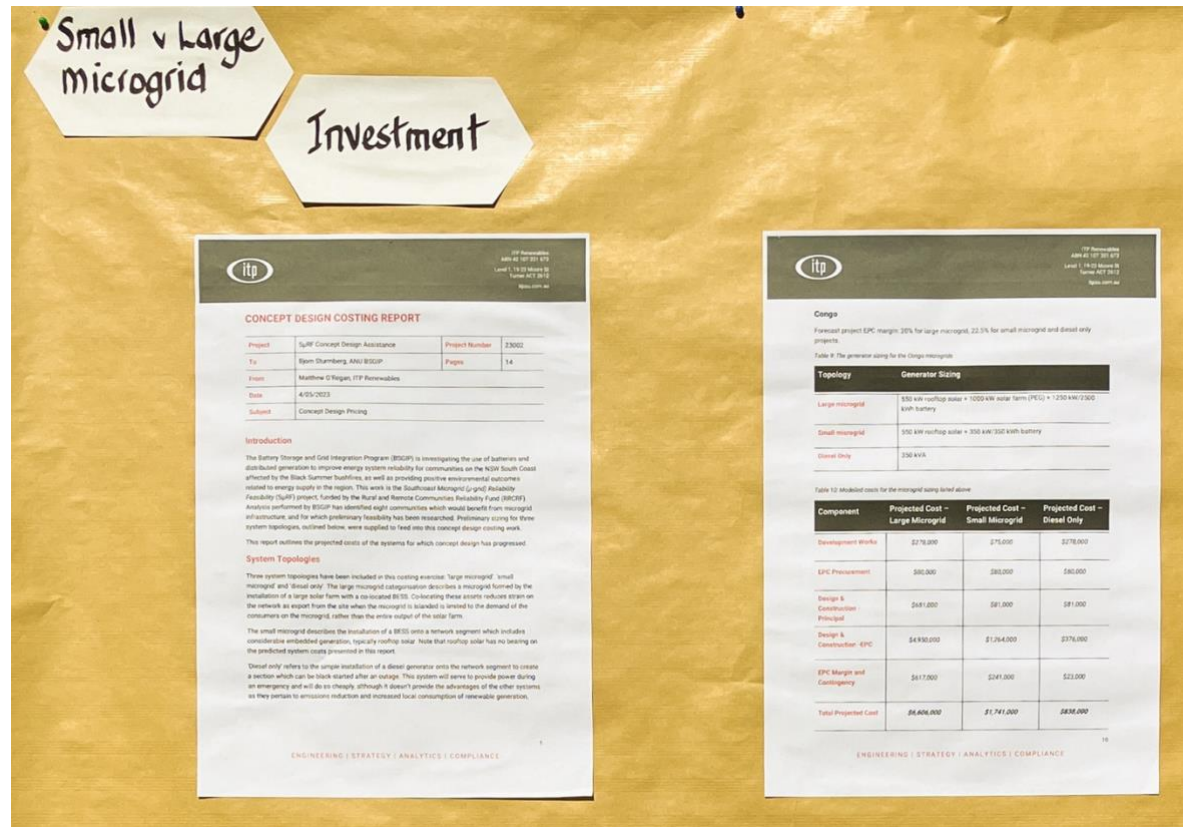
Moderator Notes...

FEASIBILITY

STEP 3

Small Microgrid: High Level Design Concept

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Moderator Notes...

FEASIBILITY

STEP 4

Large Microgrid: Design Brief offered from Rd 1 community discussion group.

The design brief was informed by the outcomes from the Round 1 consultations held during the Spring of 2022.

Large Microgrid

Congo LARGE Type 3 MG Mudmap
(Rd 1 Community discussions held Spring 2022)

OPTION A
Optimise Rooftop Solar Individual Sites

- Intended for two weeks
- No Solar farm if rooftop sufficient
- 2-3 hours a day in isolated mode
- Diesel gen - last resort

OPTION B
Solar Farm ONLY if rooftop insufficient Located beyond Congo

OPTION C
Diesel Generator (Town Site) Back-up only

Large Communal Battery (serves all community)
and/or smaller individual batteries

Retailer

- Optimise renewable sources of electricity
- Facilitate P2P sharing/ access to battery
- Interact asset owners on behalf of community

Congo LARGE Type 3 MG Guidelines (Rd 1 Community discussions held Spring 2022)

- To maintain reliability of power during high season (holiday homes) and during cloudy weather events MG will need to be connected to main grid
- Community awareness and education is required to ensure finite resource of MG is used carefully and conscientiously by residents and visitors
- We should define the non-residents who consume "willy-nilly" power resources when staying in various accommodations (holidays, school holidays, airbnb etc)
- In case of prolonged power outage, consumers need clear limits on how much energy they can draw from battery and be 'switched off' once limit is exceeded. E.g. 8kw hrs OR only water and lights

Congo LARGE Type 3 MG Guidelines (Rd 1 Community discussions held Spring 2022)

- Residents can be encouraged to provide and use personal additional resources in emergency mode to reduce pressure on MG
- Residents who are providing electricity to the mg battery (from rooftop PV's) are paid for the electrical energy they provide (feed in) consumers drawing energy from the battery pay for the energy they use. i.e. power in and out of battery is retailled (per kWh)
- Rooftop solar would be maximized (optimized to reduce the need for additional land required for solar farm generation)
- Solar Farm localities to be explored in order to maximise generation beyond capacity of Congo's rooftop capacity

Congo LARGE Type 3 MG Guidelines (Rd 1 Community discussions held Spring 2022)

- We would like access to batteries at minimal cost i.e. via federal government grant for hardware or 10% cost maximum
- Under normal usage conditions, consumers will draw as much energy as possible from battery, rather than grid
- All community are consumers - with a 'usage protocol'

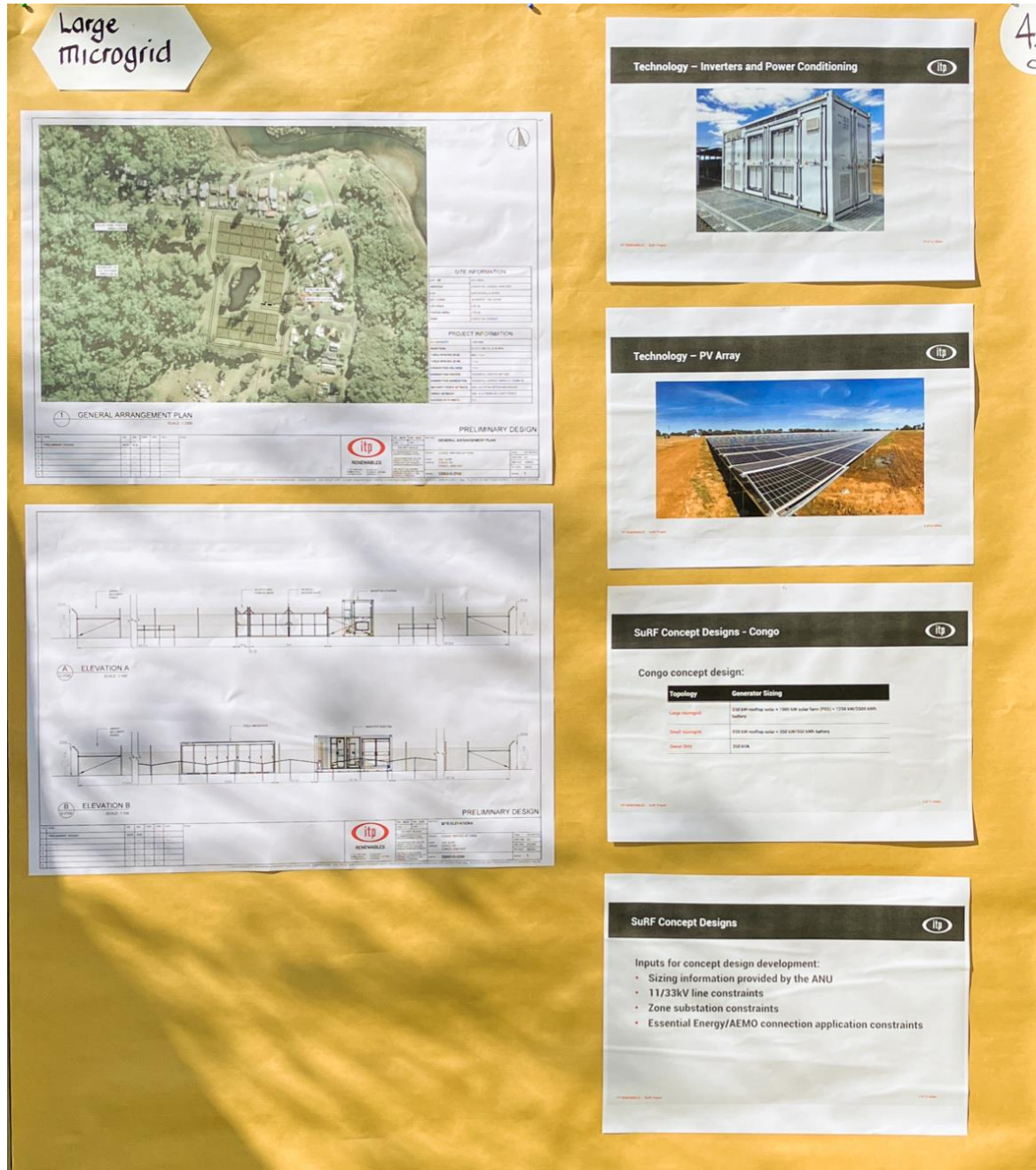
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Moderator Notes...

STEP 4

Large Microgrid: High Level Design Concept

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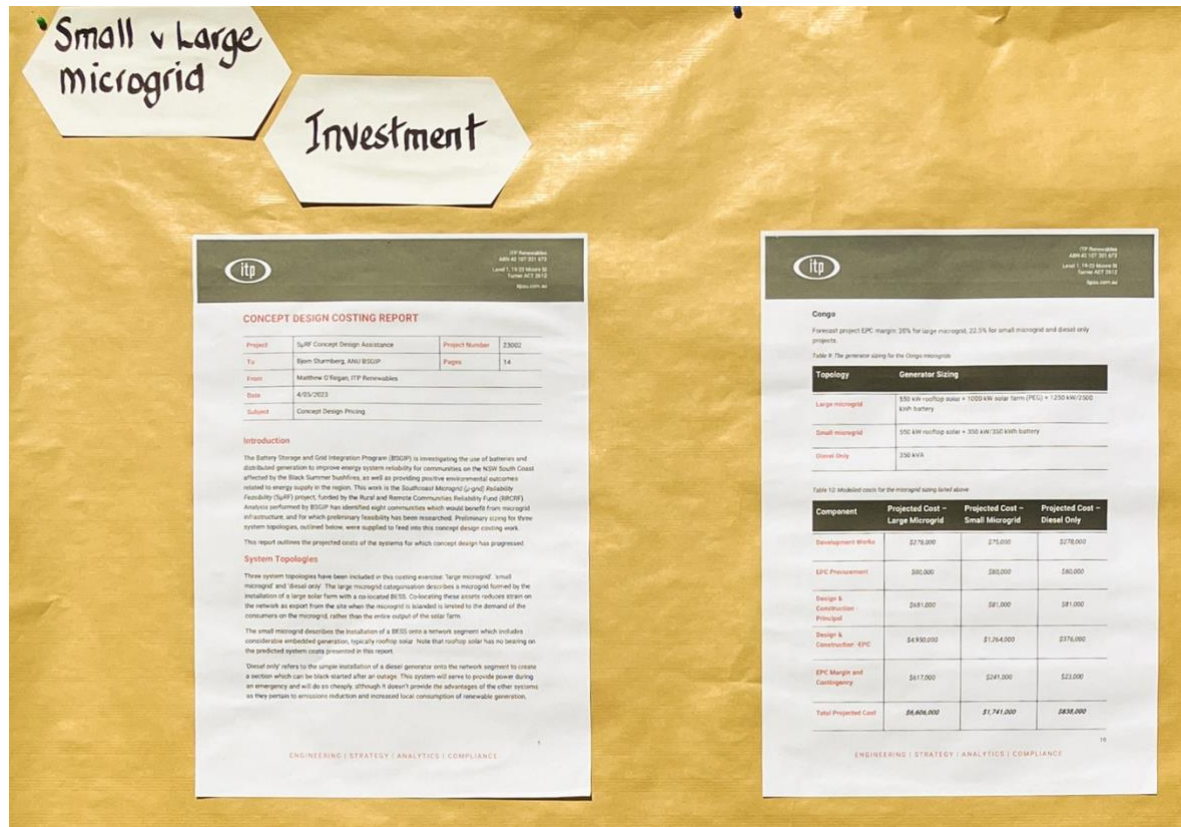


Moderator Notes...

STEP 4

Large Microgrid: High Level Design Concept

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STEP 5

Questions, Suggestions/Guidelines

Questions

What are the automation & control options for operating the MG?

What is the lifespan, disposal process for batteries - current & emerging?

What value add could a MG provide for BtB and long term rental businesses?

How can we make a MG fireproof? (or, at least, more so)

What consideration is there to building and installing equipment in coastal locations?

What might the maintenance costs be for a battery system and a S/Farm.

Suggestions/Guidelines

The project should abc.... so that.... xyz
The microgrid should.... abc.... so that.... xyz

Let's start by maximising potential roof top solar in Congo
Start small with a system that could be upgraded to include a "solar farm" in the future.

Please don't be judgemental between villages regarding obvious visually obvious businesses and the many home-run businesses that can't be seen

Property investors should lose negative gearing if they don't invest solar, battery + EV charging capability. (50% of houses are vacant)

Moderator Notes...

QUESTIONS

QUESTION	RESPONSE FROM SuRF Project team
1. What are the automation and control options for operating the MG?	
2. What is the lifespan disposal process for batteries? Current and emerging?	
3. What value add could a MG provide for B & B and long term rental businesses?	
4. How can we make a MG fireproof? (or, at least, more so?)	
5. What consideration is there to building and installing equipment in coastal locations?	
6. What might the maintenance costs be for a battery system and a Solar Farm?	

Moderator Notes...

FEASIBILITY STUDY ONLY

SUGGESTIONS/GUIDELINES

The project should ... abc ... so that ... xyz
 The microgrid should ... abc ... so that ... xyz

DESIGN GUIDELINES	RESPONSE FROM SuRF project team
Let's start by maximizing potential rooftop solar in Congo. Start small with a system that <u>could be</u> upgraded to include a "solar farm" in the future.	
Property investors should lose negative gearing if they don't invest solar, battery and EV charging capability (50% of houses are vacant)	
Please don't be judgemental between villages regarding obviously visually obvious businesses and the many home-run businesses that can't be seen.	

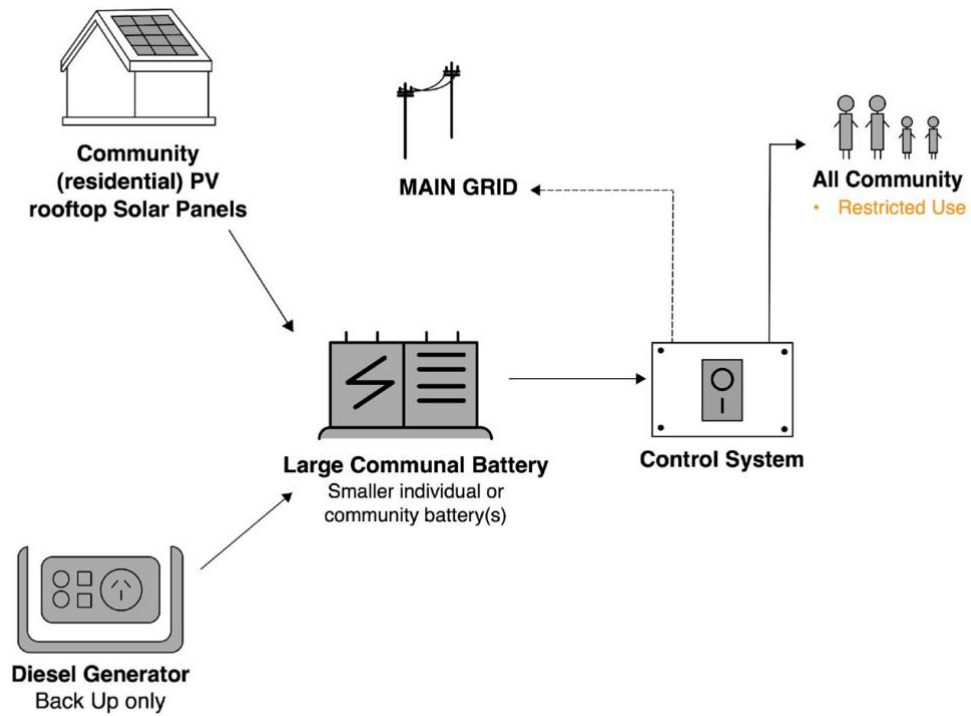
Moderator Notes...

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APPENDIX

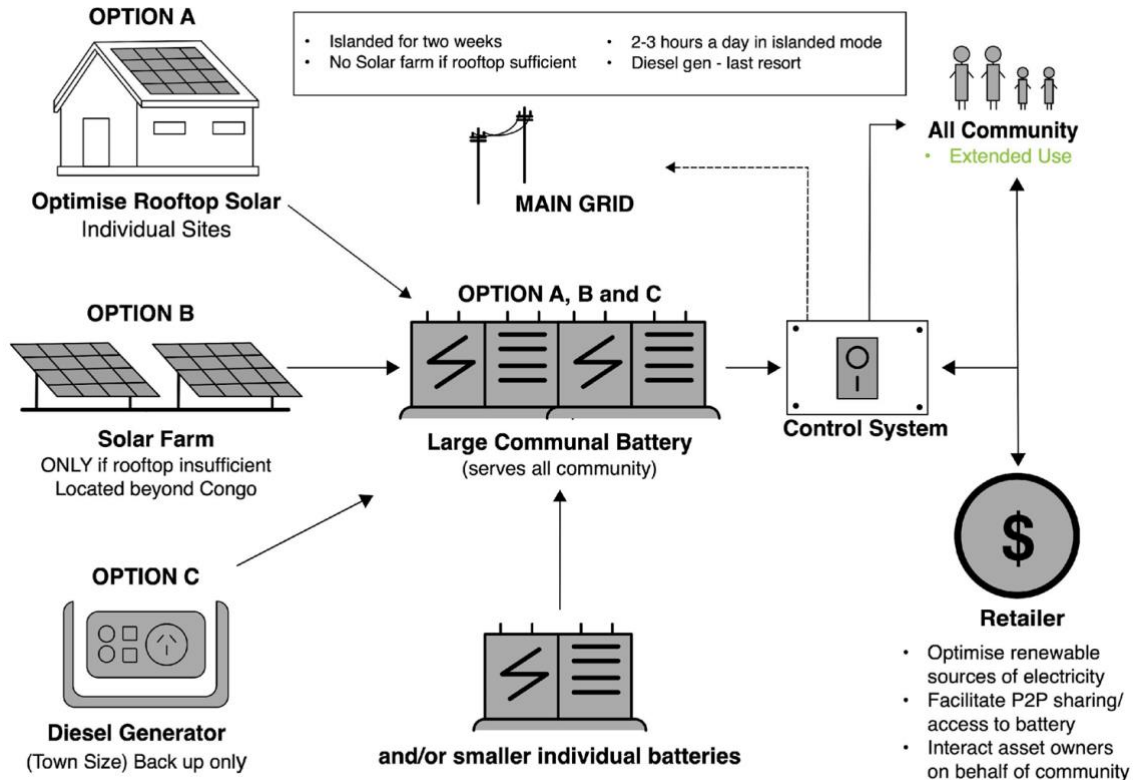
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APPENDIX A: SMALL (Type 2) MG design mud map offered from Rd1



FEASIBILITY

APPENDIX B: Large (Type 3) MG design mud map offered from Rd1



FEASIBILITY

ACKNOWLEDGEMENTS

The SuRF project team consists of: The Australian National University, SHASA, Zepben and Essential Energy.



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The SuRF project team would like to acknowledge and thank the members of the Congo community who gave their time, provided their insights and support for this important Microgrid feasibility work

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Russell Fletcher
David Setter*

*Megan Mitchell
Mandy Nott
Jill Turner
Lyn Smith
Jennifer Abel
Amadis Lachek
Kay Fry
Doug Fry
Congo Community Association*

The SuRF project team acknowledges that we meet at various locations across the traditional lands of the Yuin People. We pay our respects to the Elders, past, present and future.

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