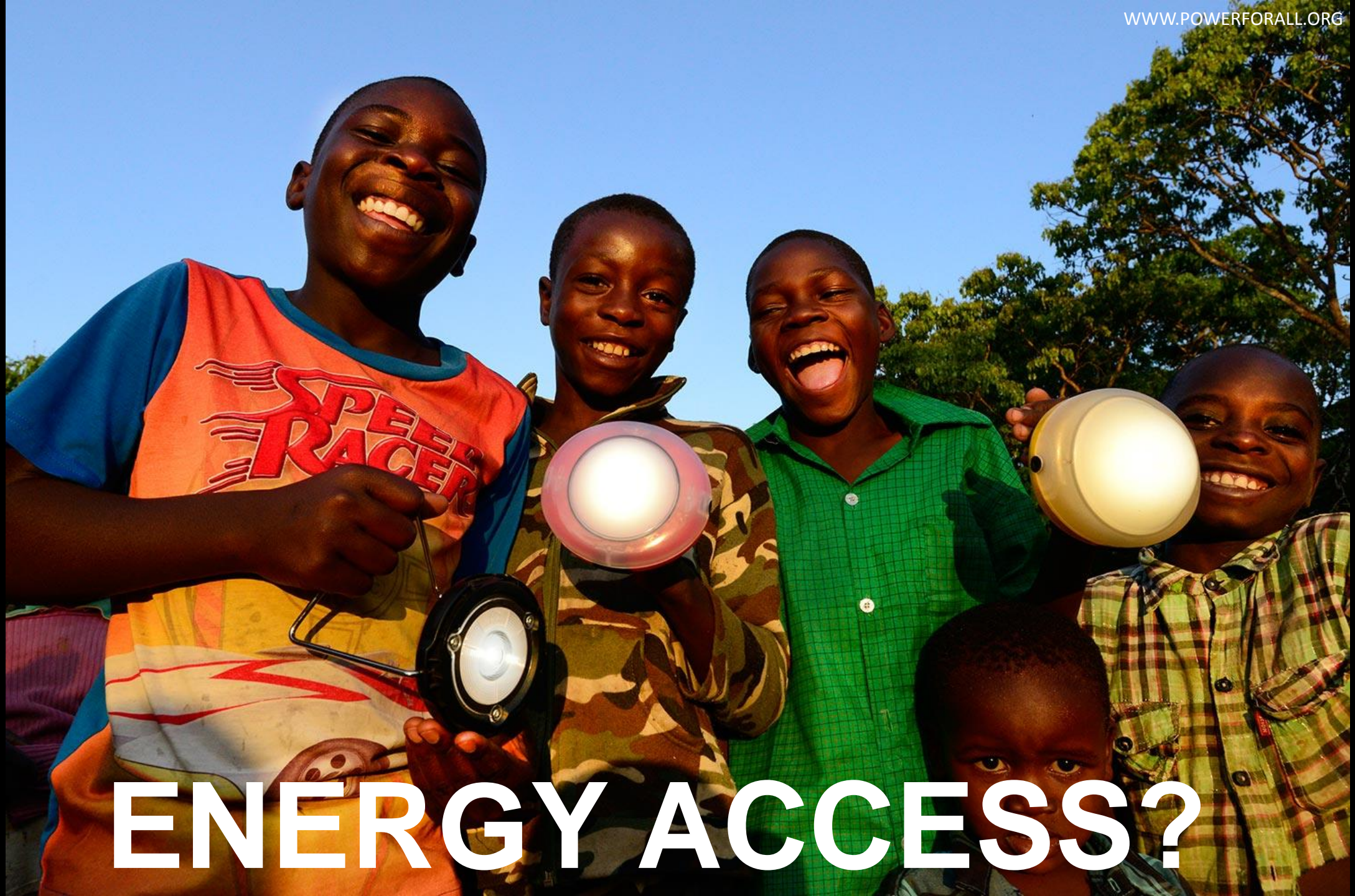




# DISTRIBUTED GENERATION

AND ENERGY ACCESS IN  
SUPPORT OF A  
NATIONAL ENERGY PLAN




**ENERGY ACCESS?**

---

# ENERGY ACCESS

WHAT IS IT AND HOW  
DO WE GET THERE





**EQUAL**

**OPPORTUNITY**

**SERVICE**

**ACCESS**

**PRICE**

**INTERIM**

**SHORT TERM**



# HOW LONG?



# SOLUTION: MINIGRID?



# GRID EXTENSION

## THE ENEMY OF MINIGRIDS

OR IS IT?





# ELECTRIFICATION GOAL

*IS JUST A WISH*



*UNTIL THERE IS A PLAN*

**TECHNOLOGY**

**IS NOT**

**A PROBLEM**



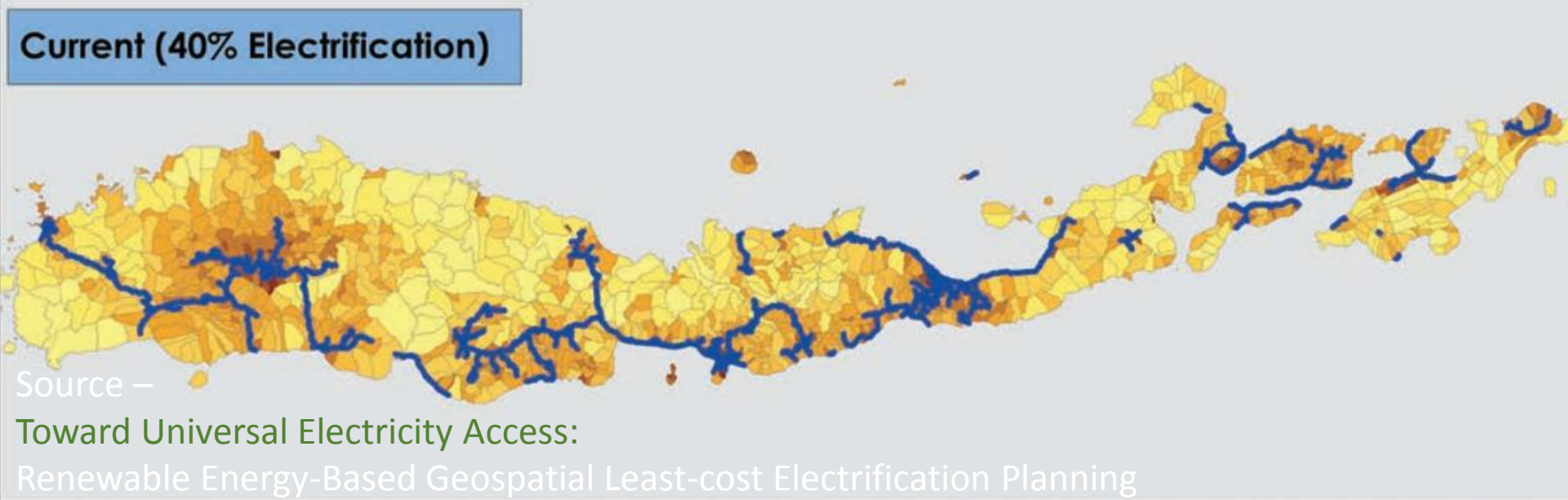
# SURVEY



- RESOURCE AVAILABILITY
- NEEDS ASSESSMENT



Source:  
 PT PLN RUPTL 2015-2024  
 (PT PLN Electricity Supply Plan  
 2015-2024)



**Data Sources:**  
Perusahaan Listrik Negara (PLN, Indonesia)  
Badan Informasi Geospasial (BIG, Indonesia)  
Badan Pusat Statistik (BPS, Indonesia)

0 25 50 100  
Kilometers

- Grid Proposed
- Village Solar Mini-Grid
- Household Solar
- Grid Connected

Existing Electric Grid

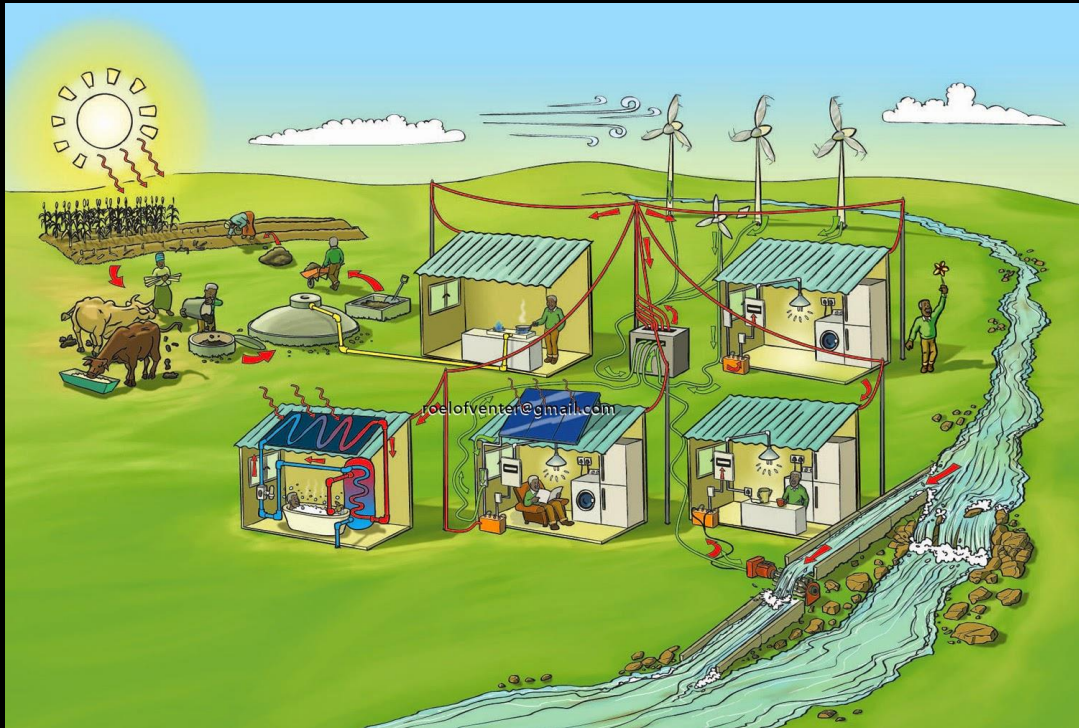
Population Density (Desa Level)

4 - 25	26 - 50	51 - 75	76 - 100	101 - 250	251 - 500	501 - 1,000	1,001 - 7,500	7,501 - 10,000
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**LEAST  
COST  
ELECTRIFICATION  
PLANNING**

**with**

**GIS  
ROOFTOP  
TAGGING**



[www.energy4humandevlopment.com](http://www.energy4humandevlopment.com)

# MINIGRID FEATURES

- Demand management control
- Allows power generation based on local resources
- Blackout prevention
- Technology agnostic
- Compatible with utility grid
- IPP business model
- Performance based contract



**IS THIS THE  
MINIGRID WE  
WANT?**



**OR THIS ONE?**



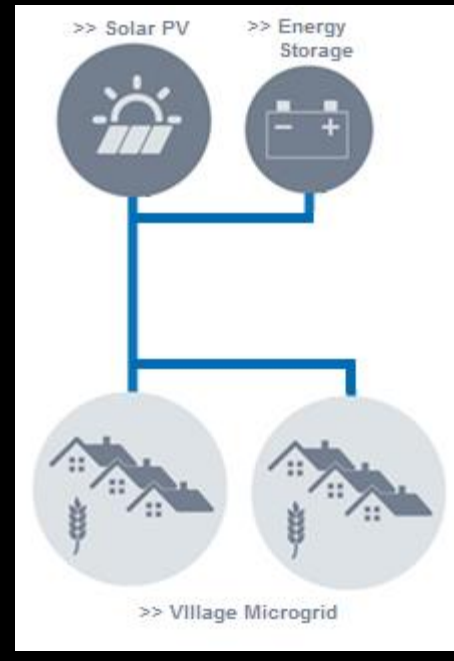
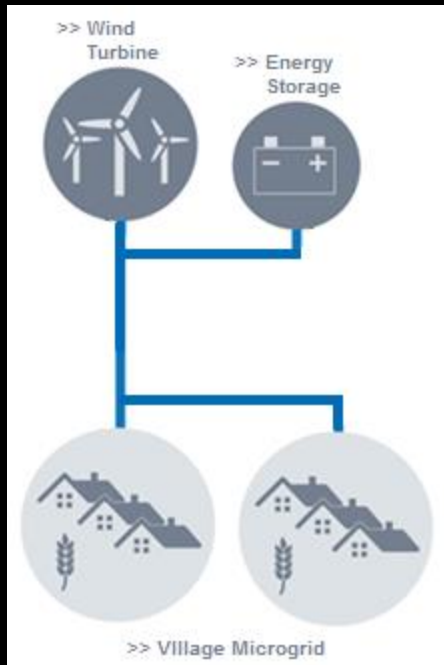


**BUSINESS  
AS USUAL**

**GOING OUT OF  
BUSINESS**

# TYPICAL MINIGRIDS

## INDIVIDUAL SYSTEMS



# INDONESIA:

# 12,800 UNELECTRIFIED VILLAGES



**INDONESIA:**

**12,800 MINIGRIDS?????**

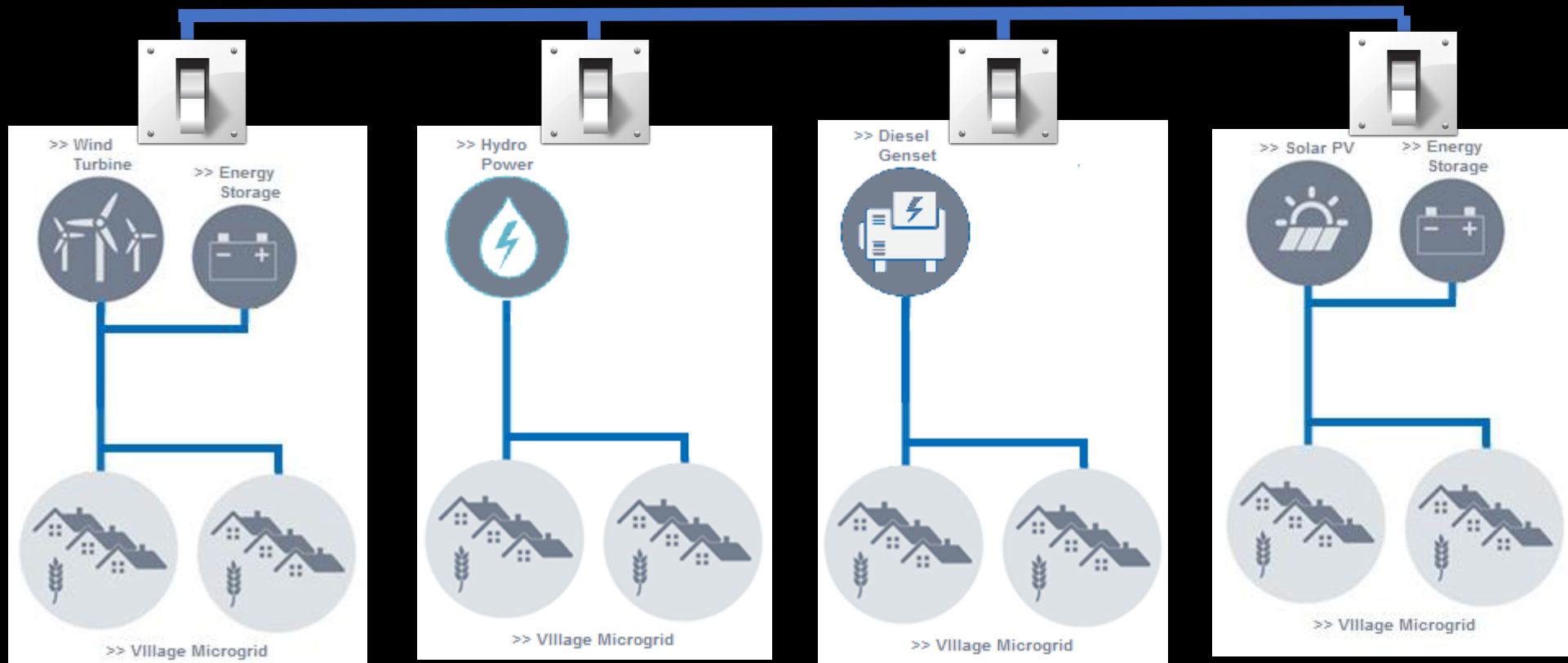




**ALOR ISLAND:**  
150,000 PEOPLE  
2800 KM<sup>2</sup>  
6 MINIGRIDS (RUN BY THE UTILITY COMPANY)

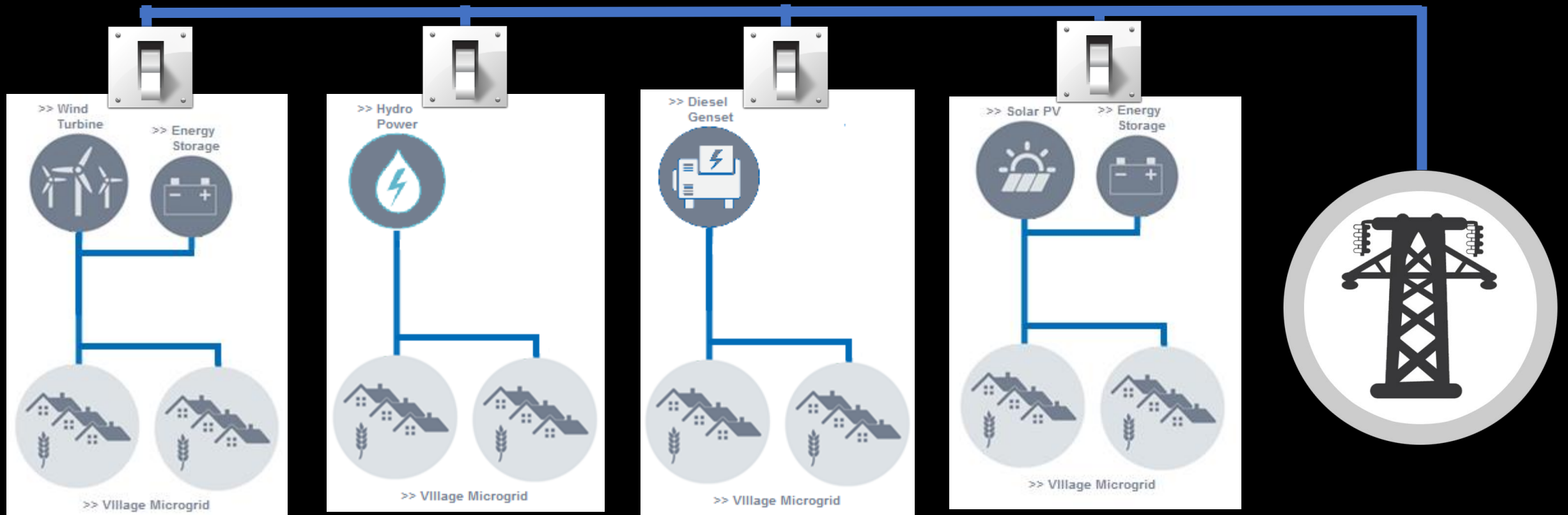
# CONNECTED MINIGRIDS

## SHARED EXCESS ENERGY



# “THE GRID” CONNECTION

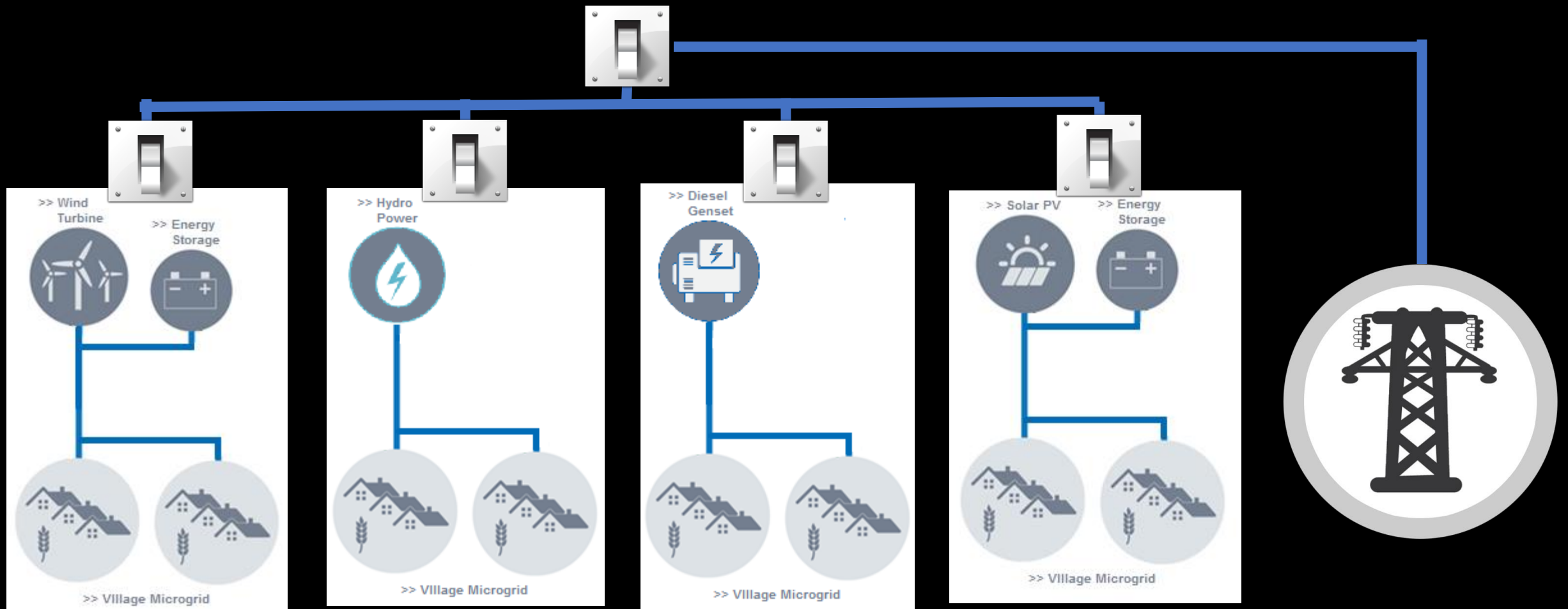
## CONNECTING TO THE PUBLIC GRID





# “THE GRID” CONNECTION

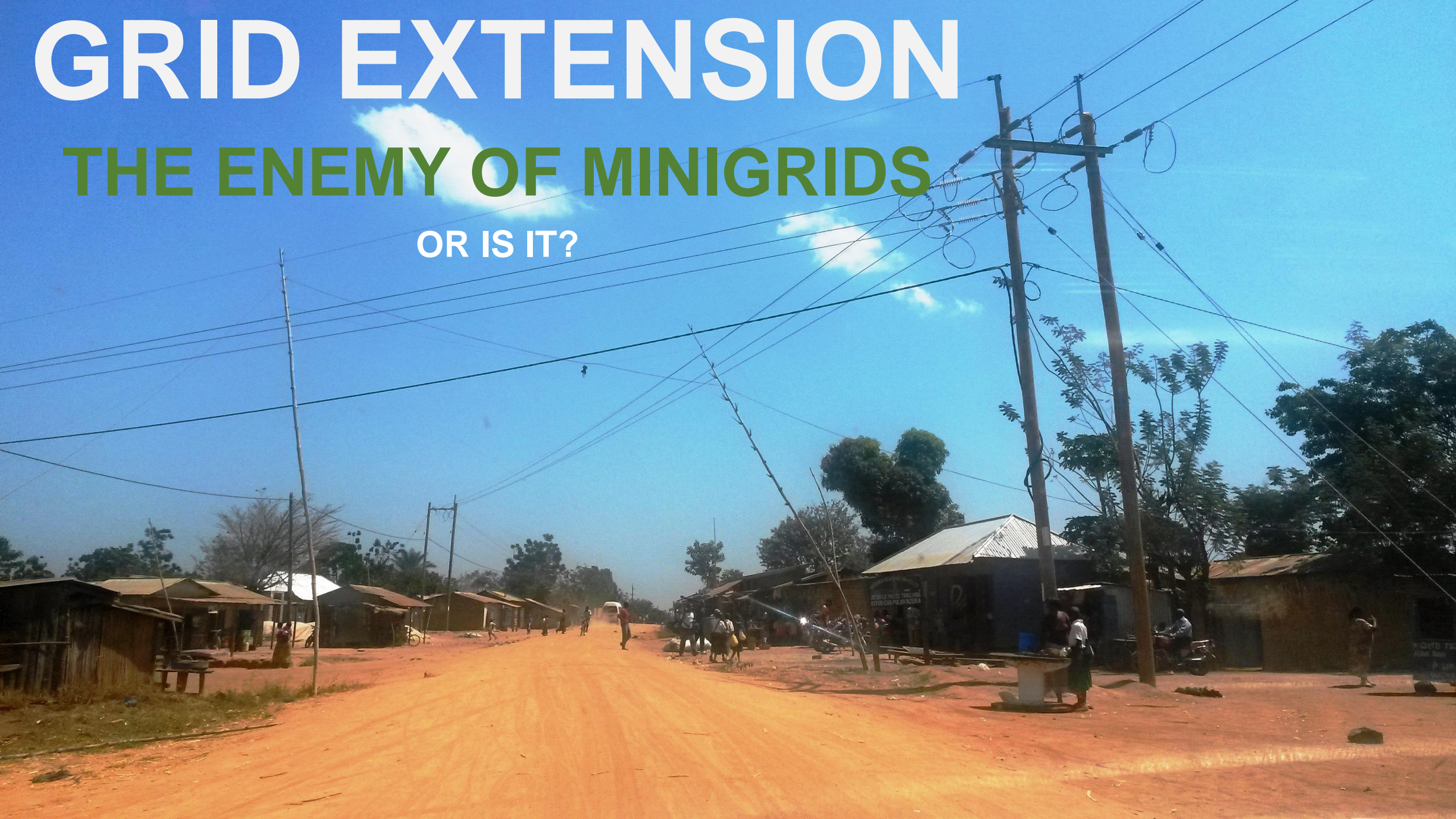
## ANOTHER WAY TO CONNECT



# GRID EXTENSION

## THE ENEMY OF MINIGRIDS

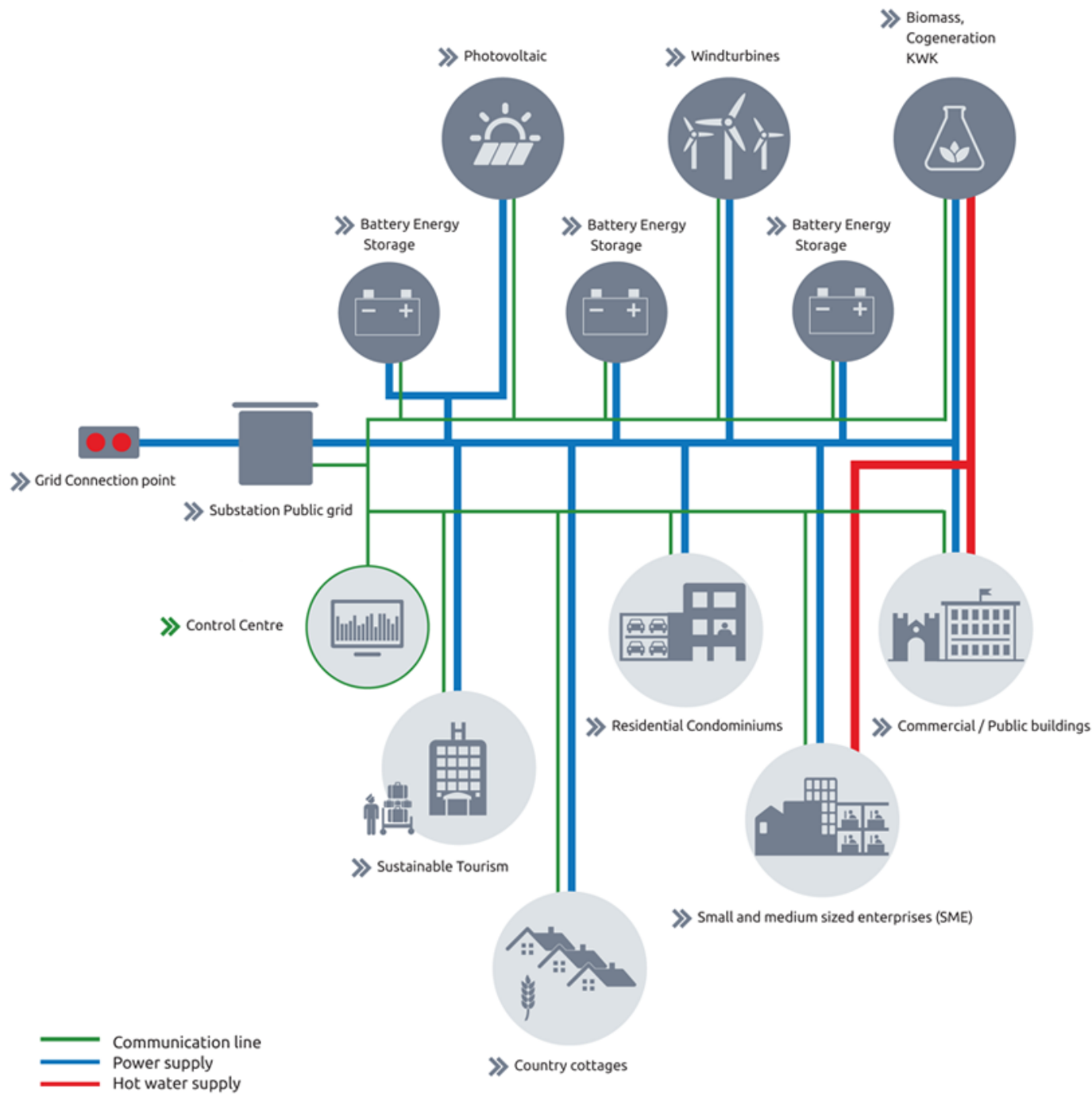
OR IS IT?





# FINANCIAL ENGINEERING

THE REAL BARRIER – RISK MANAGEMENT



# END RESULT

# 100% ELECTRIFICATION

# BY

# MAXIMIZING THE USE OF PUBLIC GRID

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THANK YOU