Transforming an Energy Grid One Scale at a Time

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FAIA

President

Resilient Power Puerto Rico


RESILIENT
POWER
PUERTO RICO
RESILIENCE BUILDING
ACROSS PUERTO RICO

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1.

PUERTO RICO IN CONTEXT

C O N T E X T

PUERTO RICO IN NUMBERS

45%

POVERTY

(ACS, 2016)

Puerto Rico's poverty rate is 3 X that of the US.

6:1

HOME VALUE :INCOME

(ACS, 2016)

Median home values = $118K

1/2 of the population´s incomes <$19K

26 %

NO HIGH SCHOOL DIPLOMA

(ACS / OECD, 2016)

> ¼ of Puerto Ricans over 25 years old lack a HSD

3.4 Billion Consumer Hours

POWER OUTAGE

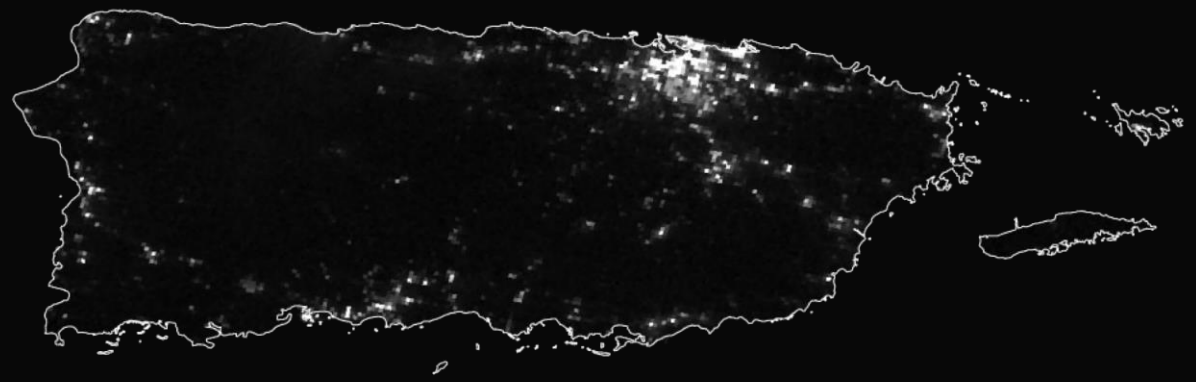
(Rhodius Group / USDOE, 2018)

María's was the 2nd longest in the World and 4.4 times that of Superstorm Sandy.

C O N T E X T

PUERTO RICO´S POWER GRID

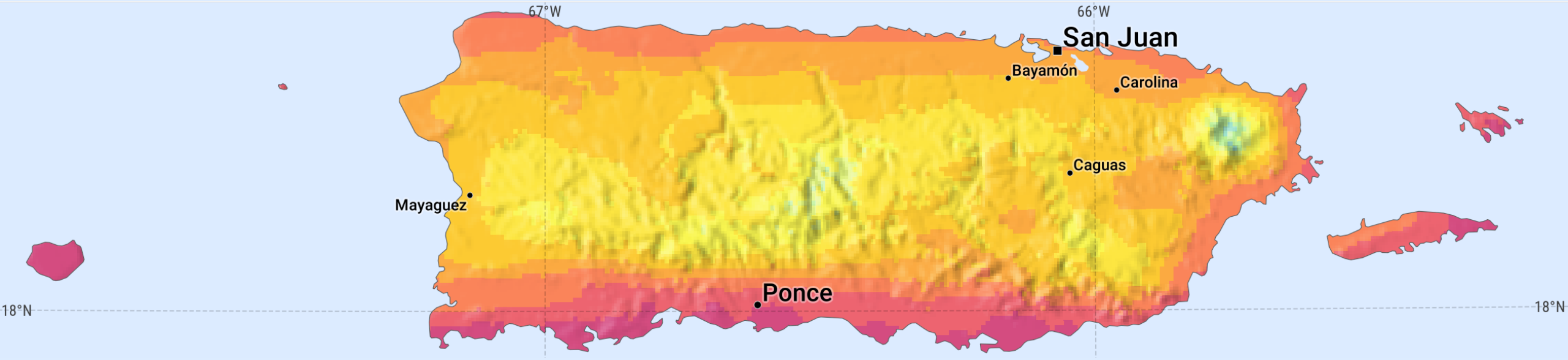
BEFORE HURRICANE MARIA



AFTER HURRICANE MARIA

CONTEXT

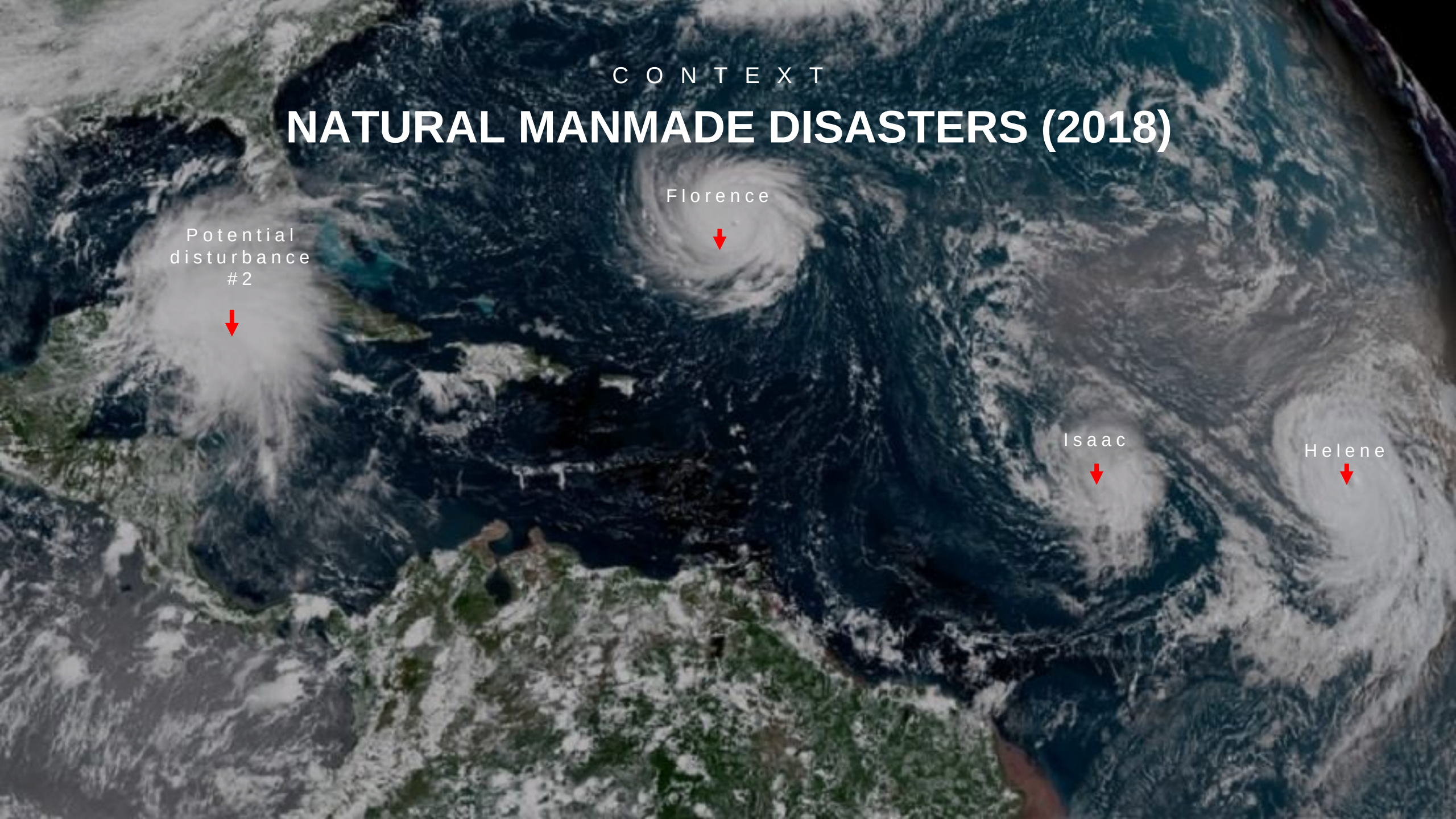
PHOTOVOLTAIC POWER POTENTIAL



AVERAGE ANNUAL SUM OF PVOUT, 1999-2016

1300 1400 1500 1600 1700 KWH/KWP


NOAA GOES 13 170918 1115 UTC NASA GSFC GOES Project
CONTEXT
NATURAL MANMADE DISASTERS (2017)
JOSE
KATIA
MARÍA


CONTEXT
NATURAL MANMADE DISASTERS (2018)
Florence
Potential disturbance #2
Isaac
Helene

C O N T E X T

NATURAL MANMADE DISASTERS (2018 HURRICANE MICHAEL)

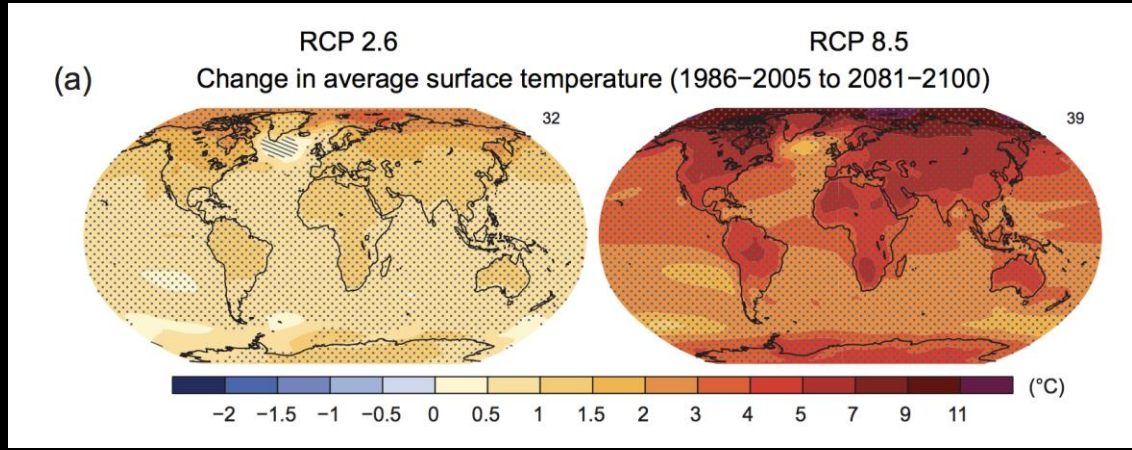
C O N T E X T

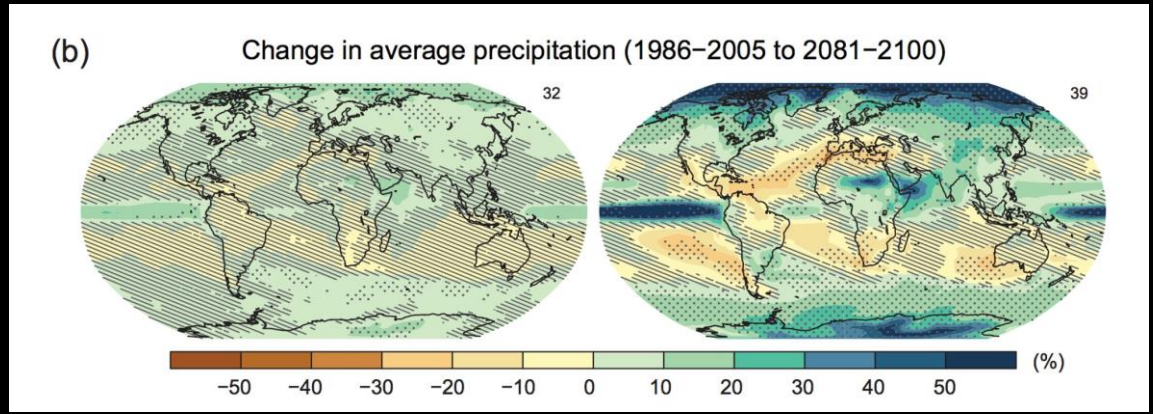
CLIMATE CHANGE REPORT

ipcc
INTERGOVERNMENTAL PANEL ON climate change

GLOBAL WARMING OF 1.5 °C

an IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty

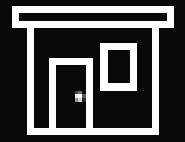




CONTEXT

CLIMATE IS HAPPENING HOW DO WE ADAPT?

ENERGY



HOUSING

COMMUNITY

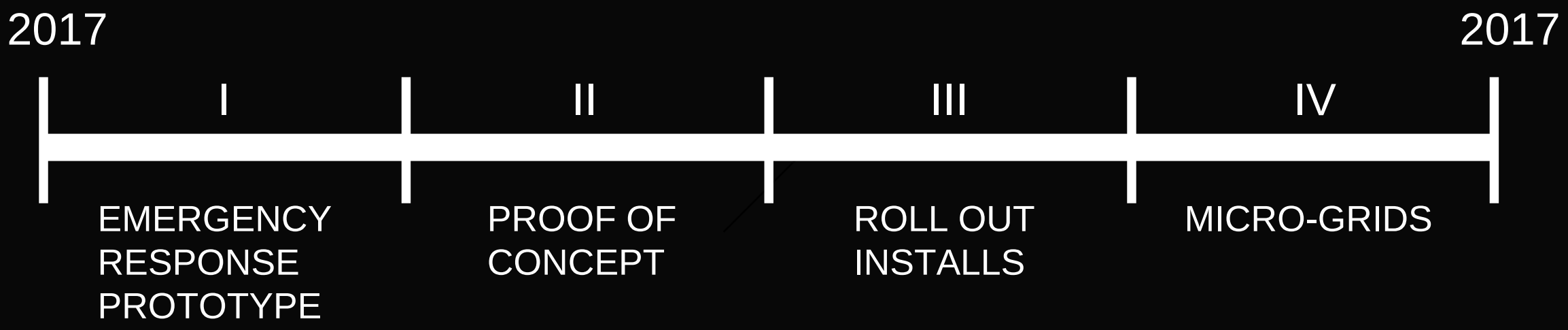
2.

ARCHITECTURE AS SOCIAL ENTREPRENEURSHIP

(ENERGY)

S O C I A L E N T R E P R E N E U R S H I P

RESILIENT POWER PUERTO RICO (RPPR)



S O C I A L E N T R E P R E N E U R S H I P

RPPR´S SCALES OF IMPACT

1.5 KW

EMERGENCY RESPONSE

Emergency Kits for small Critical Loads.

5 KW

COMMUNITY CENTERS

Energy hubs for the community.

10 KW +

MICROGRID

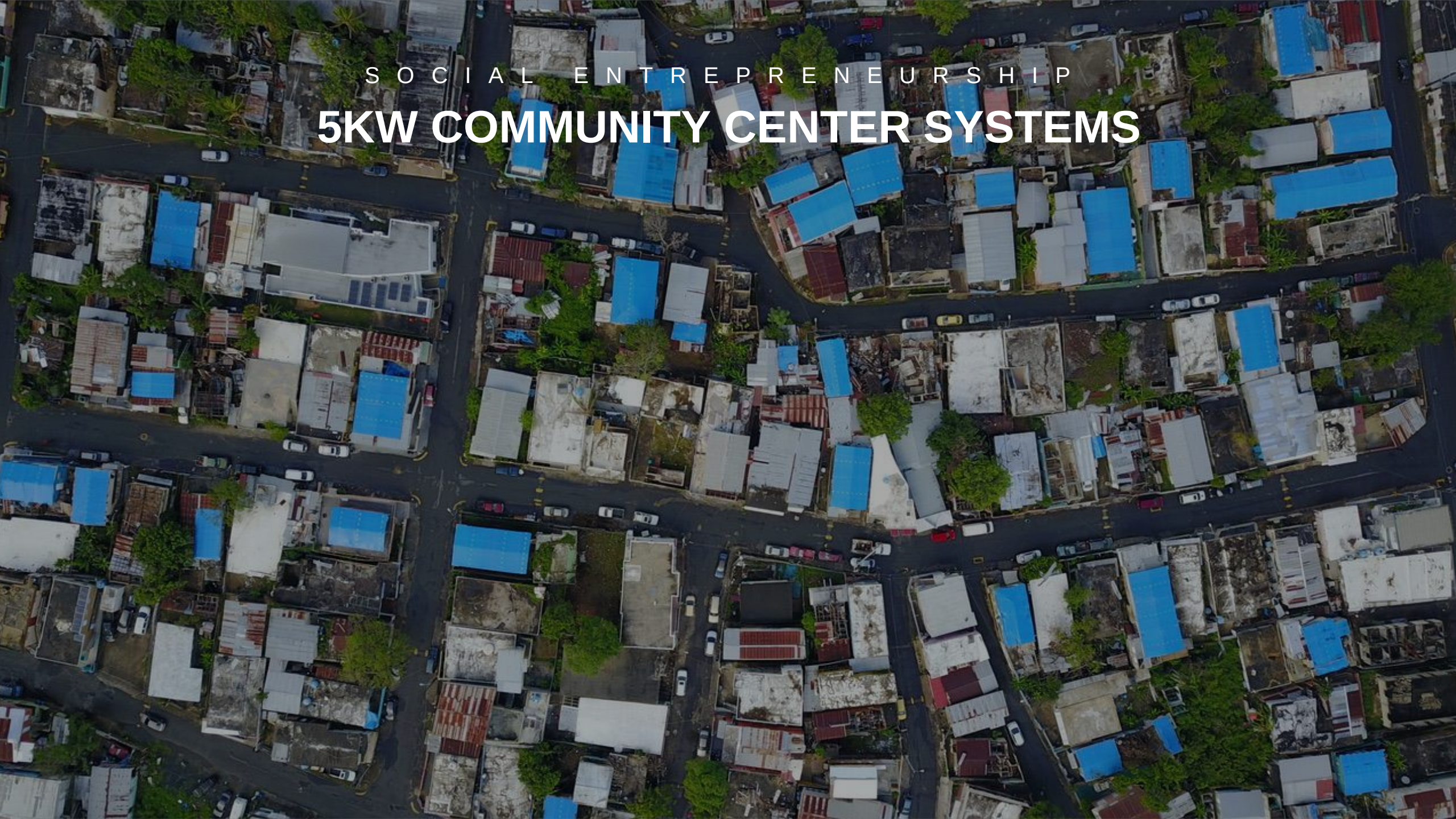
Robust energy systems for institutional facilities.

S O C I A L E N T R E P R E N E U R S H I P

1.5 KW EMERGENCY REPONSE SYSTEMS

S O C I A L E N T R E P R E N E U R S H I P

PLAYITA (1.5 KW)



SOCIAL ENTREPRENEURSHIP

5KW COMMUNITY CENTER SYSTEMS

SOCIAL ENTREPRENEURSHIP

PILOT PROJECT: CAÑO MARTIN PEÑA (5KW)

S O C I A L E N T R E P R E N E U R S H I P

CAÑO MARTIN PEÑA (5KW INSTALLATIONS)

SANTURCE

CENTRO BUENA VISTA

HATO REY

CENTRO LAS MONJAS

SAN JUAN

HIJOS DE DON BOSCO

SAN JUAN

G-8 HEADQUARTERS

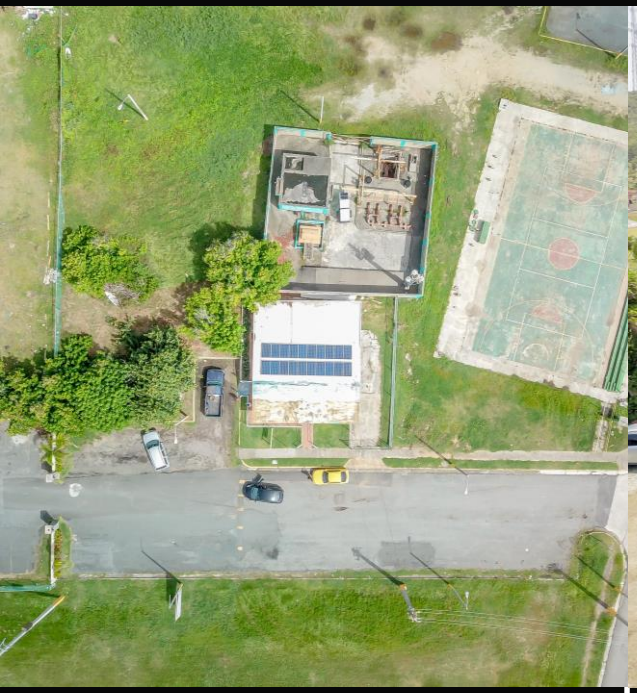
S O C I A L E N T R E P R E N E U R S H I P

COMMUNITY CENTER INSTALLATIONS (5KW)

Emergency Response Community Resilience Funded

S O C I A L E N T R E P R E N E U R S H I P

COMMUNITY CENTER INSTALLATIONS (5KW)



Maunabo

ATMAR

Maunabo

COMITÉ PRO DESAROLLO

Naguabo

DAGUAO

SALINAS

EL COQUI


OFICINA

S O C I A L E N T R E P R E N E U R S H I P

10KW+ MICRO-GRIDS (RMI PARTNERSHIP)

“A robust, diverse and inclusive renewable energy sector, where the tools and resources for the development of renewable energy micro grids are available for the benefit of communities across Puerto Rico.”

MICROGRIDS

DECREASING SENSITIVITY

CONTINUED OPERATIONS OF SOCIAL INFRASTRUCTURE WITH POWER REDUNDANCIES

MICROGRIDS

REDUCING EXPOSURE

INDEPENDENCE FROM THE CENTRALIZED FOSSIL-FUEL POWER GRID

STRENGTHENING ADAPTIVE CAPACITY

LOCAL CONTROL OF RESOURCES TO RECOVER & REBUILD

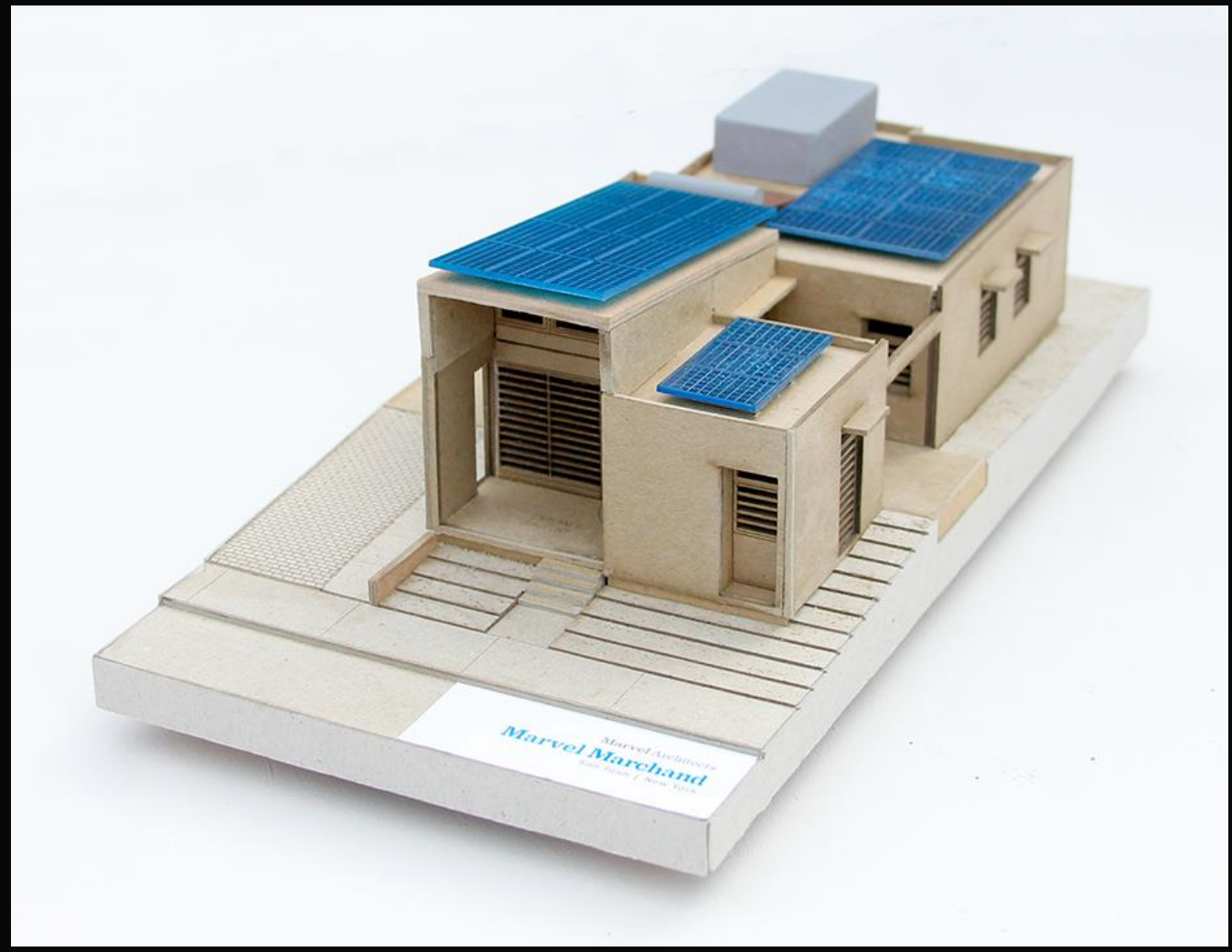
3.

PERVASIVE ALTRUISM / SHELTER IN PLACE

(HOUSING + COMMUNITY)

S H E L T E R I N P L A C E

RESILIENT AFFORDABLE HOUSING



S H E L T E R I N P L A C E

RESILIENT COMMUNITY

S H E L T E R I N P L A C E

CARIBBEAN CLIMATE CITY

S H E L T E R I N P L A C E

A RESILIENT CITY FOR THE FUTURE CARIBBEAN BASIN