



R20 Regions of Climate Action

*In collaboration with the United Nations and
Sub-National Governments around the World*

LED Streetlight Retrofit & Financing: Turnkey Concepts for Brazil October 2014

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What is the R20?

Founded in 2011 by:

- Gov. Arnold Schwarzenegger
- Pres. Ali Belhaj (Morocco)
- VP Michele Sabban (France)
- Vice Chair Xie Zhenhua (China)

& the United Nations.

Today...

- Connecting over 500 states, provinces, and other regional government members & affiliates;
- 50 technology & NGO partners;
- 105 Green Finance Network affiliates

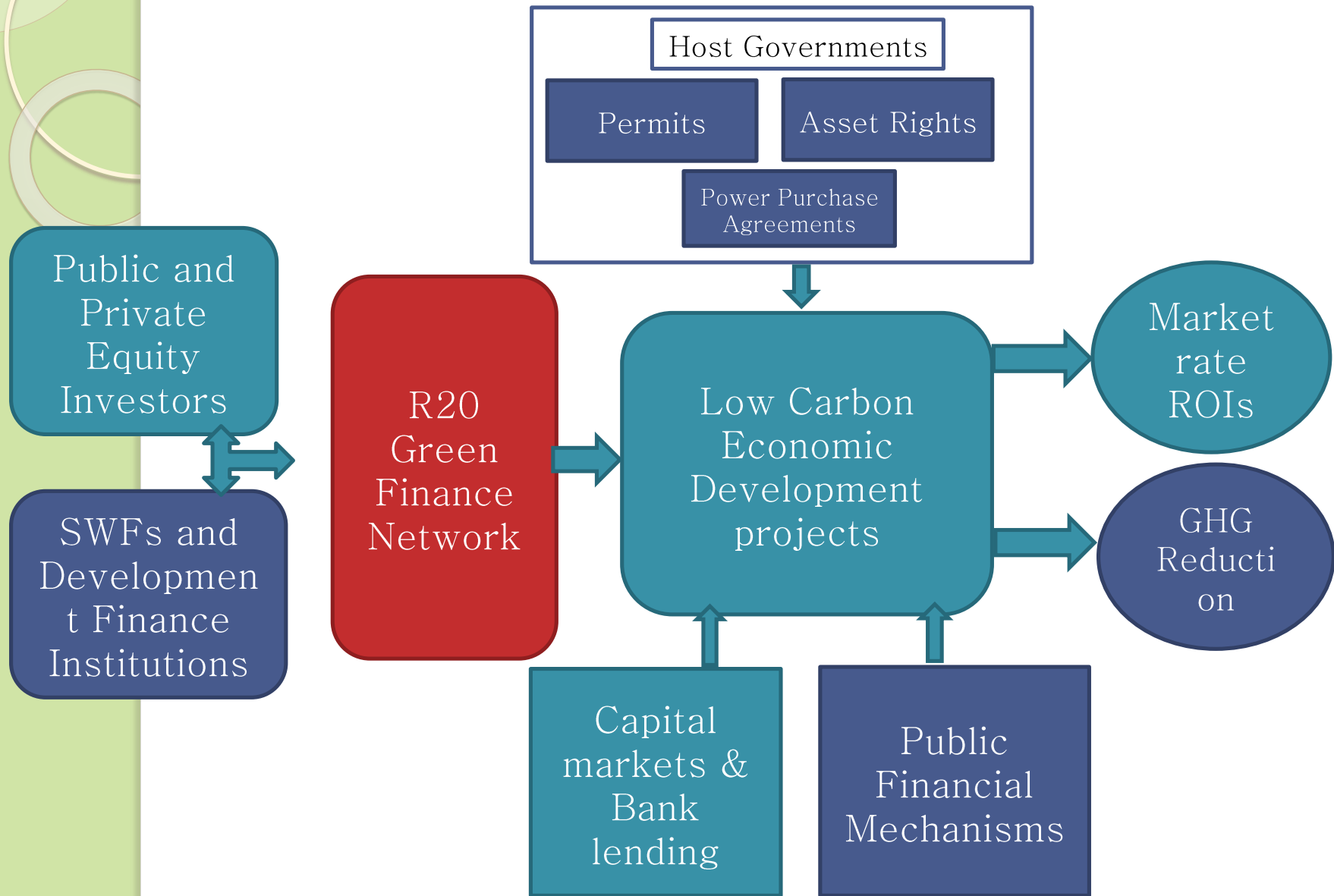
Results: Over USD \$1 billion of low-carbon economic development projects in 20 countries are now in process.



What Does the R20 Do?

- Together, R20 members *share policies* for reducing greenhouse gases;
- *Craft plans and projects* to achieve those goals and measure/report results;
- Exchange technology, science, and resources to *implement low carbon development projects*;
- Use the R20 Green Finance Network to *finance member projects* that scale up solutions and build sustainable economies

R20 Project Sourcing and Financing At-A-Glance



R20 Project Example: 21st Century LED Streetlight Retrofit



- Better visibility and illumination of LED over traditional lighting improves safety for drivers and pedestrians.
- Modular design to add security cameras, Wi-Fi hot spots, solar power, traffic sensors, and other features.
- Reduced energy, maintenance, and greenhouse gases.

R20 Technology Partner: Lighting Science Group

Lighting Science Group (LSG) is an independent American company that manufactures the most advanced LED lighting technology in the world.



Headquarters for design, engineering and manufacturing is located in Satellite Beach, Florida. Established 2007, LSG is led by lighting industry veterans.

- *LSG will manufacture lighting products for this project in Brazil.*

LED Replacement Savings Example



	Typical MH HID Cobrahead Fixture	LED Fixture
Wattage	129	55
Annual Energy Cost	\$45	\$19
Lamp Life Hours	15,000	60,000+
Annual Maintenance Cost (average)	\$35 * (\$20 bulb cost, \$100 service call with bucket truck)	\$0
Annual Savings		\$61 (\$.08 KWH, 12 hours/day)
Lifetime Savings		\$835

Rio de Janeiro Options

Rio de Janeiro Roadmaster and Prolific Option

Existing Source, Wattage with NEMA Decal Codes and Colors*						Secondary Cross Over					Payback in Years @ 0.138 kWh				
Existing Wattage	Source	NEMA DECAL	Power Draw Watts	Qty	Base Cost	LSGC Crossover to the LSR / DBR Prolific Series	Power Draw Watts	Savings	Base Cost	Payback in Years @ 0.138 kWh	Cost of Using Existing System	Cost of New LED System	Cost Difference	Annual Savings	Payback in Years
70	HPS	07	95	82873	\$ 130.00	Road Master 055	55	42.11%	\$ 215.00	0.96	\$ 16,118,798.50	\$ 20,511,067.50	\$ 4,392,269.00	\$ 4,568,666.50	0.96
100	HPS	10	128	75000	\$ 130.00	Road Master 055	55	57.03%	\$ 215.00	0.71	\$ 14,587,500.00	\$ 18,562,500.00	\$ 3,975,000.00	\$ 5,620,043.52	0.71
150	HPS	15	188	68000	\$ 130.00	Road Master 075	75	60.11%	\$ 215.00	0.54	\$ 13,226,000.00	\$ 16,830,000.00	\$ 3,604,000.00	\$ 6,727,950.03	0.54
400	HPS	40	465	50000	\$ 250.00	DBR2 CW R2 2B GRY PCR	300	35.48%	\$ 900.00	4.75	\$ 15,725,000.00	\$ 46,625,000.00	\$ 30,900,000.00	\$ 6,507,446.40	4.75
35	MH	03	50	1000	\$ 130.00	Road Master 035	35	30.00%	\$ 215.00	1.32	\$ 194,500.00	\$ 247,500.00	\$ 53,000.00	\$ 40,124.15	1.32
70	MH	07	95	1000	\$ 130.00	Road Master 055	55	42.11%	\$ 215.00	0.96	\$ 194,500.00	\$ 247,500.00	\$ 53,000.00	\$ 55,128.53	0.96
100	MH	10	128	8000	\$ 130.00	Road Master 055	55	57.03%	\$ 215.00	0.71	\$ 1,556,000.00	\$ 1,980,000.00	\$ 424,000.00	\$ 599,471.31	0.71
150	MH	15	188	1000	\$ 130.00	Road Master 055	55	70.74%	\$ 215.00	0.48	\$ 194,500.00	\$ 247,500.00	\$ 53,000.00	\$ 110,943.71	0.48
175	MH	17	215	8000	\$ 130.00	Road Master 075	75	65.12%	\$ 215.00	0.46	\$ 1,556,000.00	\$ 1,980,000.00	\$ 424,000.00	\$ 921,158.78	0.46
200	MH	20	240	1000	\$ 250.00	Road Master 075	75	68.75%	\$ 215.00	0.41	\$ 194,500.00	\$ 247,500.00	\$ 53,000.00	\$ 130,418.93	0.41
250	MH	25	295	1000	\$ 250.00	LSR4 CW R2 2B GRY PCR	146	50.51%	\$ 445.00	1.35	\$ 1,572,500.00	\$ 2,387,500.00	\$ 815,000.00	\$ 602,731.58	1.35
400	MH	40	465	3659	\$ 250.00	DBR1 CW R2 2B GRY PCR	200	56.99%	\$ 900.00	3.25	\$ 1,150,755.50	\$ 3,412,017.50	\$ 2,261,262.00	\$ 695,814.64	3.25
80	MV	08	110	8000	\$ 130.00	Road Master 055	55	50.00%	\$ 215.00	0.83	\$ 1,556,000.00	\$ 1,980,000.00	\$ 424,000.00	\$ 513,047.81	0.83
125	MV	12	150	8000	\$ 130.00	Road Master 075	75	50.00%	\$ 215.00	0.70	\$ 1,556,000.00	\$ 1,980,000.00	\$ 424,000.00	\$ 609,073.92	0.70
250	MV	25	295	48000	\$ 250.00	LSR3 CW R2 2B GRY PCR	100	66.10%	\$ 445.00	1.10	\$ 15,096,000.00	\$ 22,920,000.00	\$ 7,824,000.00	\$ 7,111,383.55	1.10
400	MV	40	465	34374	\$ 250.00	LSR4 CW R2 2B GRY PCR	146	68.60%	\$ 445.00	0.73	\$ 10,810,623.00	\$ 16,413,585.00	\$ 5,602,962.00	\$ 7,650,760.77	0.73
Totals											\$ 95,289,177.00	\$ 156,571,670.00	\$ 61,282,493.00	\$ 42,464,164.13	1.44

R20 Provides Innovative Financing

- Replace lights with no upfront cost;
- Pay a low monthly lease equal to or less than current monthly

Transaction from City Expenditure Perspective						
YEAR:	1	2	3	4	5	6
Existing light periodic replacement & annual electricity cost	227	65	65	97	65	65
Existing Light Cumulative Cost	227	292	357	454	519	584
LSG Replacement LED Light	97	97	97	97	97	97
LSG Cumulative	97	194	291	388	485	582

These LEDs will last years after the payback period, saving even more money for the city/state.



R20 Aligned the interests of the city; local manufacturers; & local utilities for investors...

- Cities: “Costs too high (import duties) and technology unreliable”
 - R20 found a global LED leader; linked to local e-manufacturers.
 - R20 engaged with Eletrobras (largest utility) to validate technology.
- Manufacturers: “Without a clear market, global and local manufacturers hesitated to set up in-country production”
 - R20 analyzed 13 cities (over 1.5 million fixtures) and brought them to the manufacturers, creating new green businesses and green jobs locally.
- Investors: “Ready to invest, but we’ re not project developers”



R20 Can Help Any City Save Money and Reduce Greenhouse Gases

- For a no-cost assessment of your lighting resources and a proposal for converting them to efficient LEDs and for more information about the R20 Regions of Climate Action, visit www.Regions20.org