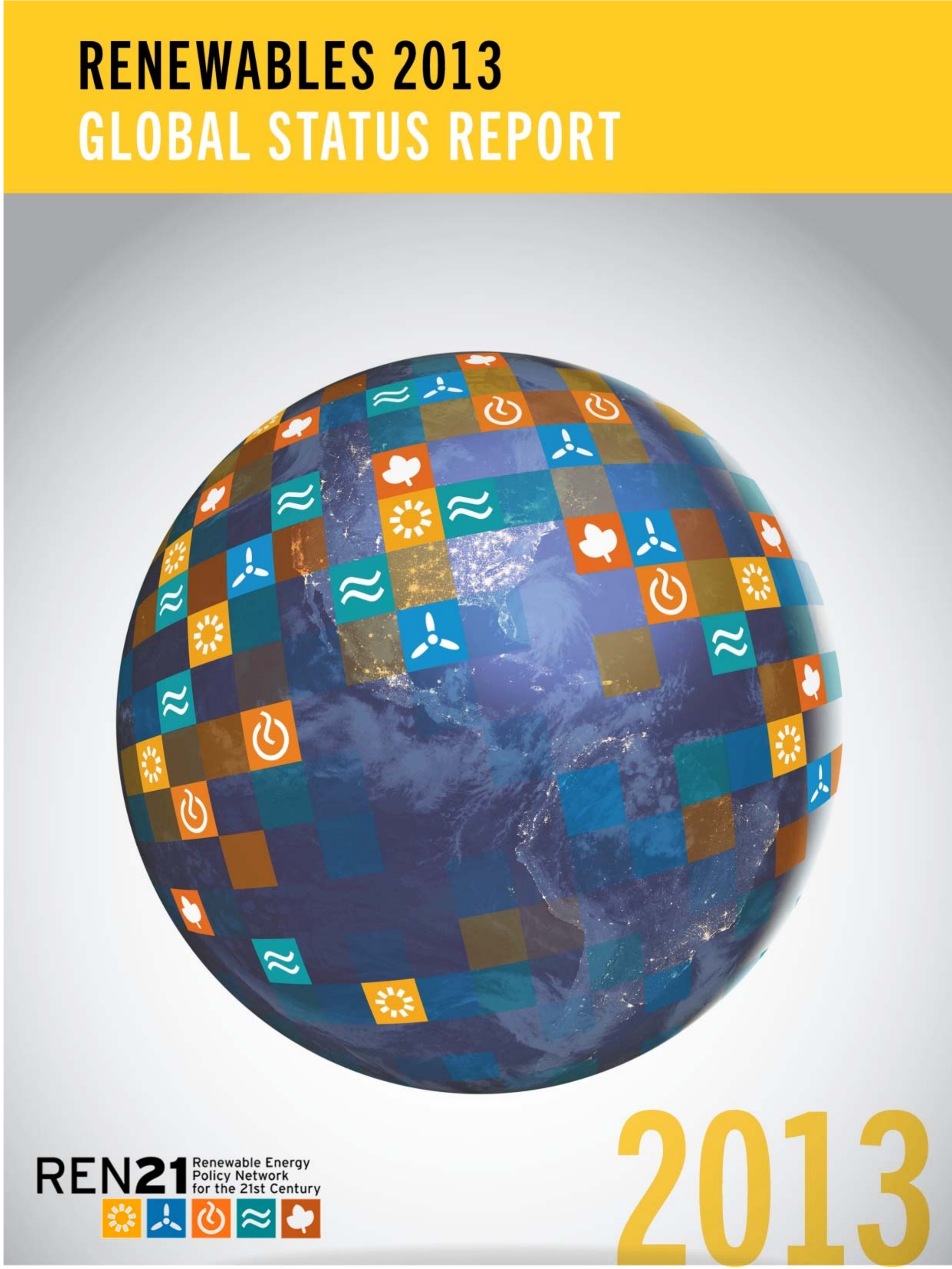

REN21 Renewable Energy Policy Network for the 21st Century

REN21's Renewables Global Status Report – Focus on Africa

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AFRICA: Presentation Overview

- Markets & Industries
- Renewable Energy Investment
- Policy Landscape
- Rural Renewables in Africa
- Conclusions: Key Challenges and Drivers

AFRICA: Markets & Industries

- Traditional markets still dominant
- Strong growth amongst BRICS
- Africa starting to show presence, especially in the CSP market

TOTAL CAPACITY AS OF END-2012

	Renewable power (incl. hydro)	Renewable power (not incl. hydro)	Renewable power per capita (not incl. hydro)[2]	Bio-power	Geothermal power	Hydropower	Concentrating solar thermal power (CSP)
1	China	China	Germany	United States	United States	China	Spain
2	United States	United States	Sweden	Brazil	Philippines	Brazil	United States
3	Brazil	Germany	Spain	China	Indonesia	United States	Algeria
4	Canada	Spain	Italy	Germany	Mexico	Canada	Egypt/Morocco
5	Germany	Italy	Canada	Sweden	Italy	Russia	Australia

AFRICA: Markets & Industries: BIOENERGY

Traditional Biomass

- **68%** African populace -> traditional biomass for heating and cooking.
- **76%** in Sub-Saharan Africa (>650 million people)
- These shares significantly lower in Asia and Latin America.

Bio-power

- Bagasse CHP: several countries (Mauritius, Tanzania, Uganda, Zimbabwe…)
- Planned development in several other African countries, incl. Kenya.

Biofuels

- Very limited, markets slowly **expanding**.
- **Ethanol** production: from 270 million litres (2011) to ~300 million litres (2012).

AFRICA: Markets & Industries: CSP

TABLE R6. CONCENTRATING SOLAR THERMAL POWER (CSP) GLOBAL CAPACITY AND ADDITIONS, 2012

Country	Total End-2011	Added 2012	Total End-2012
	(MW)		
Spain	999	951	1,950
United States	507	0	507
Algeria	25	0	25
Egypt	20	0	20
Morocco	20	0	20
Australia	3	9	12
Chile	0	10	10
Thailand	5	0	5
World Total	1,580	970	2,550

- South Africa one of the most active markets in 2012: 200MW under construction:
  - **50 MW power tower**
  - **100 MW trough plant**
  - **50 MW trough plant**
- Namibia announced plans for a CSP plant by 2015.
- Ambitious MENA targets for **>1GW** of new CSP capacity.

AFRICA: Markets & Industries: SOLAR PV

- More than **100 MW** of capacity operating in Africa.
- Large grid-connected plants under construction in South Africa, up to **50 MW** in size.
- Chinese companies building solar PV plants in at least **20** African countries.
- **CPV** is also spreading to new markets in North Africa.

AFRICA: Markets & Industries:
SOLAR THERMAL HEATING & COOLING

- Used in several African countries, notably: Egypt, Mozambique, Tunisia, Zimbabwe, South Africa
- Tunisia's PROSOL programme increased annual installations more than 13-fold over five years, to more than 64 MWth
- South Africa the most developed African market:
  - Rise in installers in South Africa
  - Challenges to domestic manufacturers

AFRICA: Markets & Industries: GEOTHERMAL

Kenya:

- Largest African producer of geothermal power, total installed capacity <200 MW by end 2012.
    - 2.5 MW Eburru wellhead plant commissioned early 2012
    - 5 MW modular wellhead unit came on line at a KenGen facility.
    - By May 2013, Ormat Technologies announced commercial operation of a new 36 MW unit at the Olkaria III complex.
- Public-private partnerships under development: aim to add 560 MW at Olkaria in 140 MW increments.

AFRICA: Markets & Industries: GEOTHERMAL

Geothermal, elsewhere in Africa:

- Rwanda funding exploratory drilling: estimated **700 MW** of geothermal potential.
- World Bank's Global Geothermal Development Plan aims to manage risk of **exploratory drilling** for developing countries.
- World Bank/Iceland: "Geothermal Compact" supporting **exploration** and providing **technical assistance** in the Great Rift Valley.
- African Union Commission, German Ministry for Economic Cooperation and Development (BMZ), EU-Africa Infrastructure Trust Fund:
  - **USD 66 million (EUR 50 million)** Geothermal Risk Mitigation Facility for Eastern Africa: support surface studies and exploration drilling.

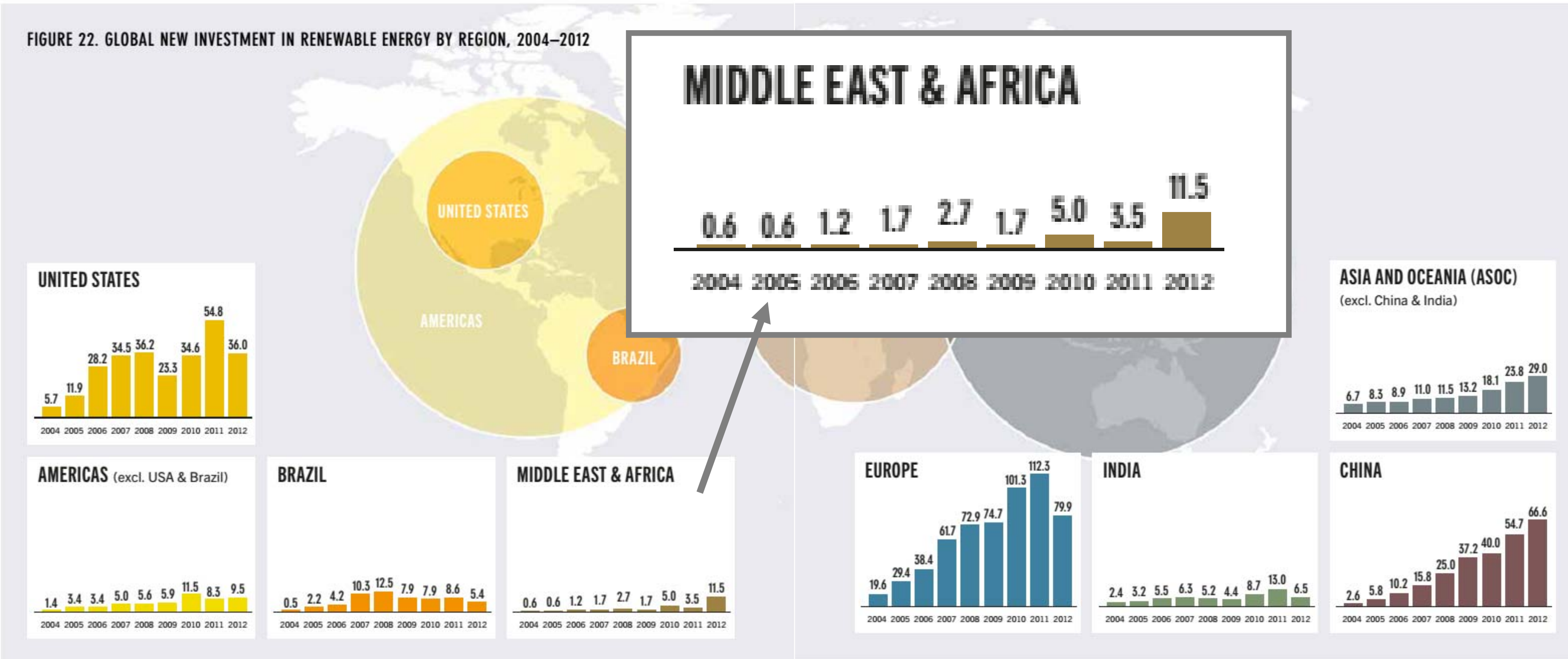
AFRICA: Markets & Industries: HYDROPOWER

- Smaller plants under construction in several countries.
- Grand Renaissance Dam in Ethiopia:
  - First phase commissioning in 2013.
  - Will be largest hydropower facility on the continent: **6000 MW**
- Several transmission projects underway to export this power to other countries on the horn of Africa.
- Ethiopia-Kenya Electricity Highway approved: **2,000 MW** link -> electricity exports to supply-constrained East Africa.

AFRICA: Markets & Industries: WIND

- North Africa currently the dominant region.
- Significant recent installations:
  - Tunisia almost doubled its capacity, adding **50 MW**.
  - Ethiopia joined the list of countries with commercial-scale wind farms, installing **52 MW**.
  - Construction started on several South African projects totalling more than **0.5 GW**.

AFRICA: Renewable Energy Investment



AFRICA: Renewable Energy Investment

- **Increased African investment**: declines in many other regions.
- South Africa the **8th highest** investor globally in 2012 in terms of allocated finance.
- South Africa -> **USD 5.7 billion**; Morocco **USD 1.8 billion**; Kenya **USD 1.1 billion**.
- Smaller, new development banks:
  - Development Bank of Southern Africa: **USD 1 billion** (earmarked)
  - African Development Bank (**USD 800 million** in Morocco)

AFRICA: Policy Landscape

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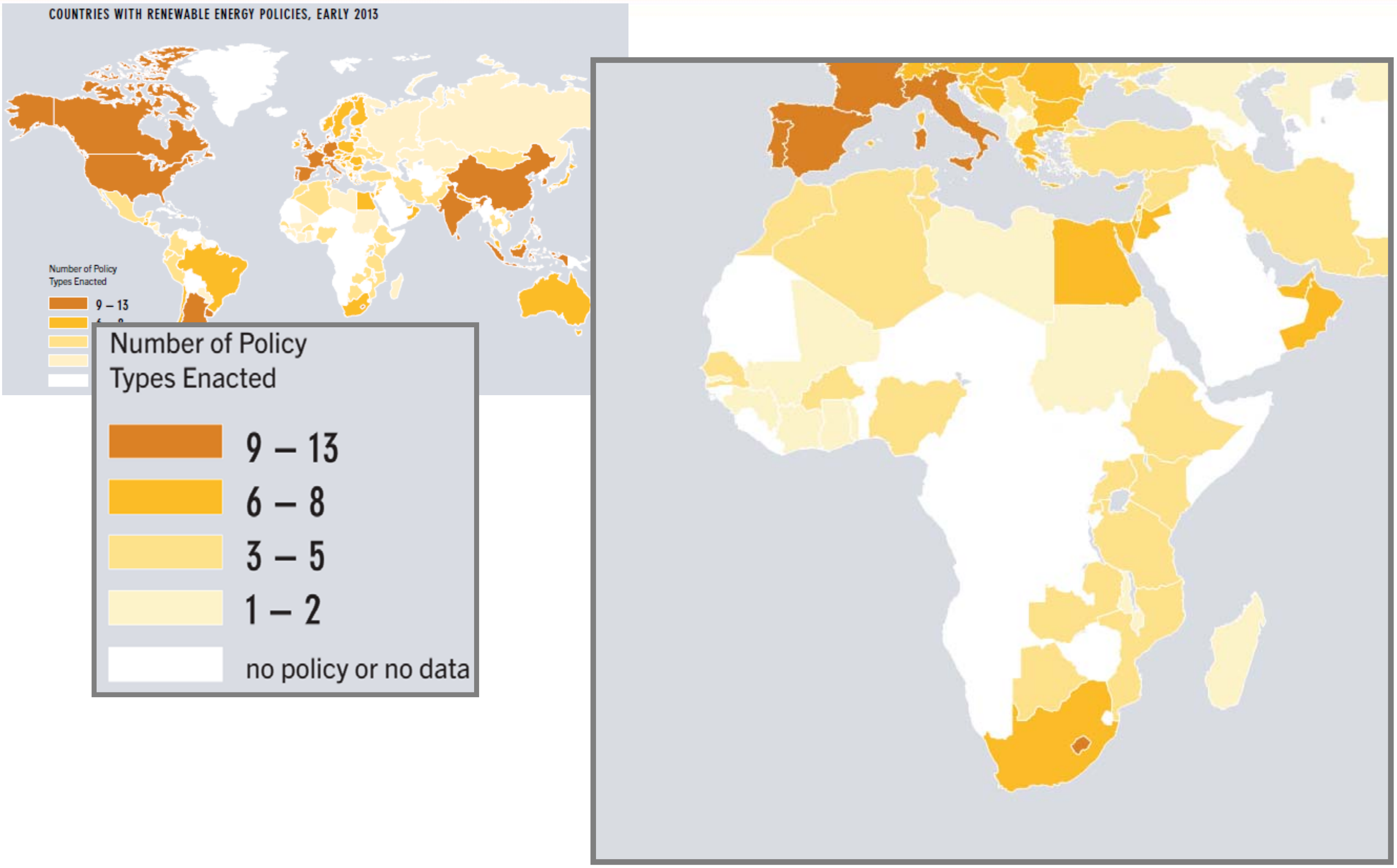


AFRICA: Policy Landscape

- The 15 **ECOWAS** countries adopted a regional renewable energy policy, including:
  - **10%** electricity from renewables by **2020**, **19%** by **2030**.
- Ambitious new wind and solar targets in the MENA region:
  - Egypt: **2,800 MW** of CSP, **700 MW** solar PV by 2027.
  - Libya: **3%** renewables by **2015**, **7%** by **2020**, **10%** by **2025**.
  - Djibouti: **100%** renewables by **2020** (zero as of 2009).
- Lesotho 260 MW of renewable power by 2030.

AFRICA: Rural Renewables

TABLE R18. POPULATION RELYING ON TRADITIONAL BIOMASS FOR COOKING

Regions and Selected Countries	Population	
	Percent	Millions
Africa	68%	698
Nigeria	74%	117
Ethiopia	96%	82
Democratic Republic of the Congo	93%	63
Tanzania	94%	42
Kenya	80%	33
Other Sub-Saharan Africa	75%	328
North Africa	1%	2
Developing Asia[1]	51%	1,814
India	66%	772
Bangladesh	91%	149
Indonesia	55%	128
Pakistan	64%	111
Philippines	50%	47
Vietnam	56%	49
Rest of Developing Asia	54%	171
Latin America	14%	65
Middle East	5%	10
All Developing Countries	**49%**	**2,588**
World[2]	**38%**	**2,588**

- 68% lacking modern energy in Africa, higher in sub-Saharan Africa.
- ECOWAS to electrify up to 78 million households by 2030, largely through **mini-grids** (renewables, diesel, battery hybrid systems).
- Top-down approaches (as adopted by rural electrification agencies in sub-Saharan Africa in the late 1990s) making way for enabling policy frameworks developed through bottom-up (endogenous) processes.

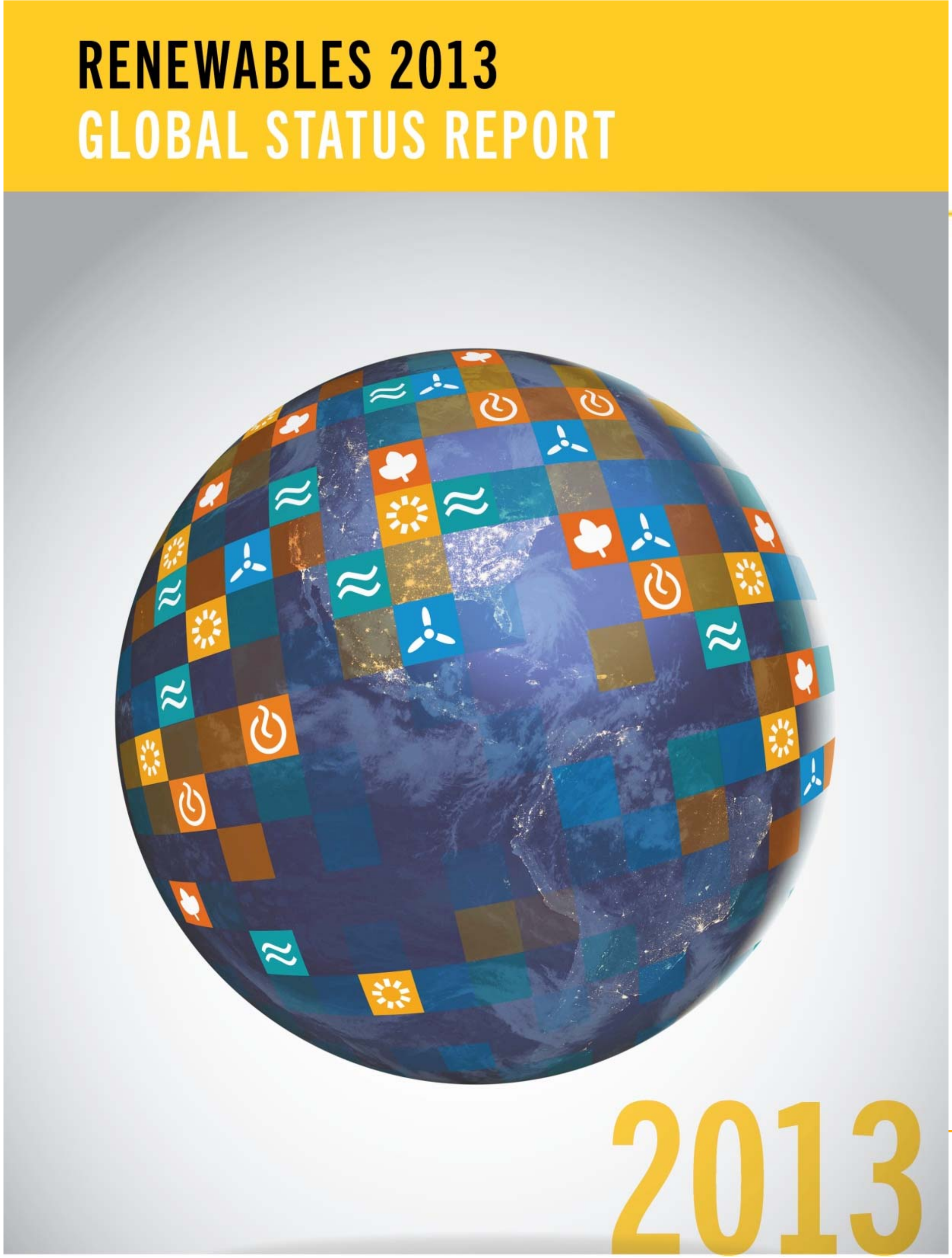
CONCLUSION: KEY CHALLENGES & DRIVERS

Challenges:

- **Large investment gap**: large quantities of power required, capital investments lagging far behind energy demand.
- **Urgent short-term socio economic challenges** can dominate national and regional budgets.
- **Negative international perceptions**: Companies active in Africa strongly positive, those with no presence overwhelmingly negative.

Drivers:

- **World class resources**: Especially solar, geothermal, wind, hydro…
- **Unprecedented** and robust economic **growth**.
- **More stable** government and robust policy making, especially in the industrial and energy sectors.
- **Surging** energy demand.



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Thank you

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