Malaysia

focus on
Opportunities in Renewable Energy

GBP International

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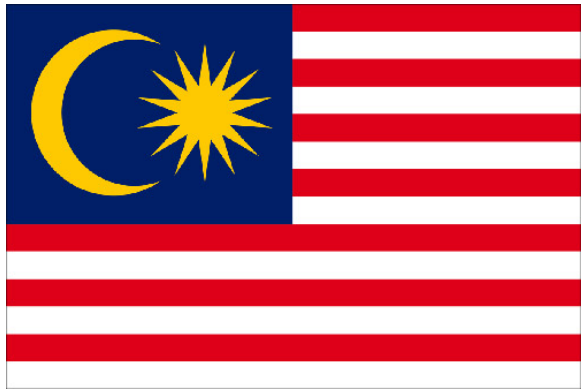


Malaysia at a glance

Population:
29 million

System of Government:
Parliamentary Democracy with a constitutional Monarch

Major Languages:
English, Bahasa Malaysia, Mandarin, Tamil

GDP growth:
~ 6%

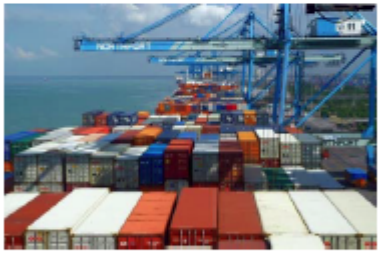
Per capita income:
~ 6,000 €

Adult Literacy:
>94%

Higher Education and Research:
38 Universities and 500 colleges, polytechnics and industrial training institutes

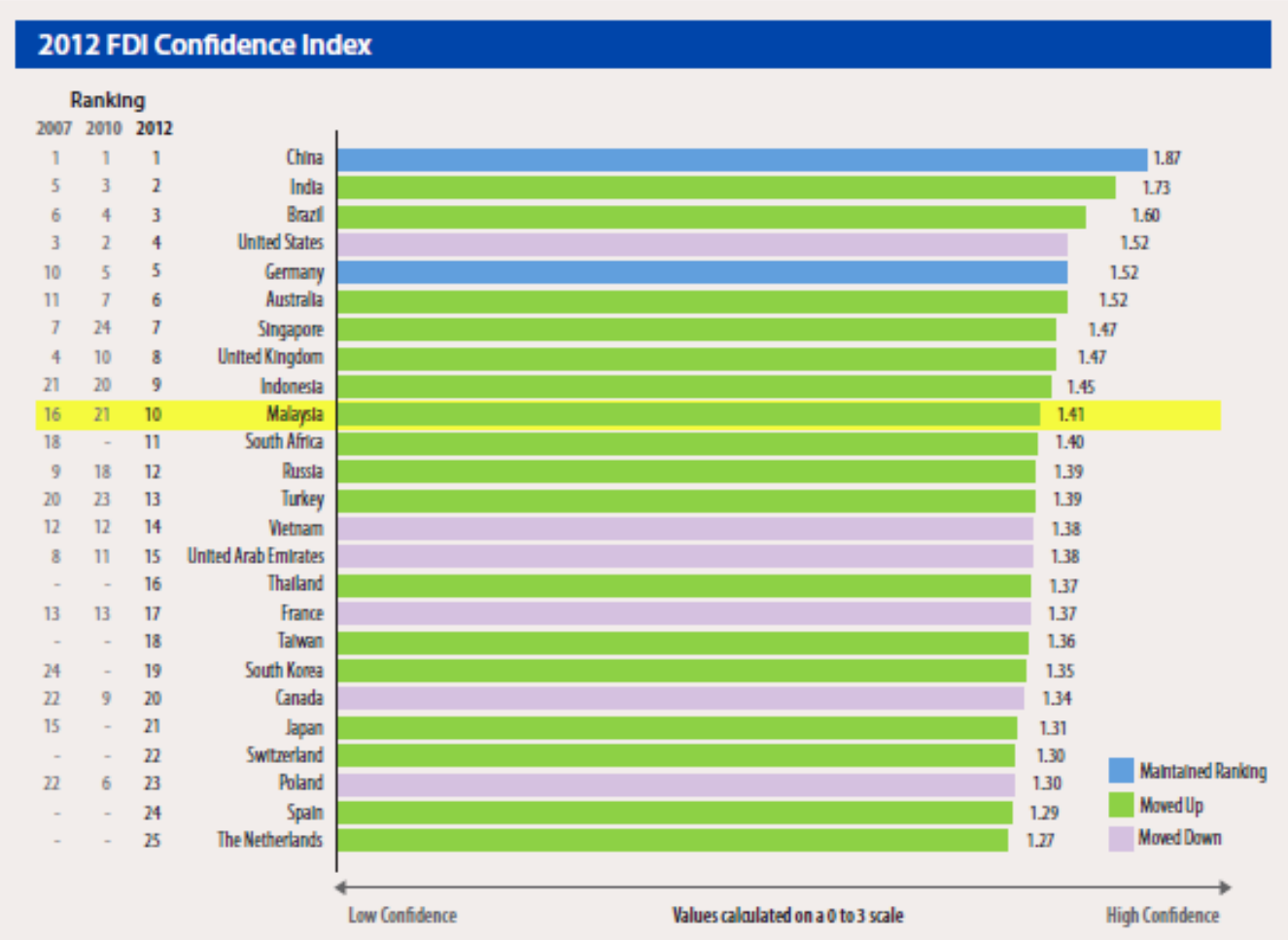
Labour Force:
~ 11 million

Malaysia at a glance



Investor Confidence Index

- Investor confidence moved up in 2012



12 National Key Economic Areas

- Malaysia will leverage its competitive advantages by prioritizing investment and policy support behind a limited number of key growth engines.

Focus on Renewable Energy

- Economic growth requires sufficient energy sources.
- Malaysia has far-sighted policies concerning renewable energy sources.

Why Renewable Energy in Malaysia?

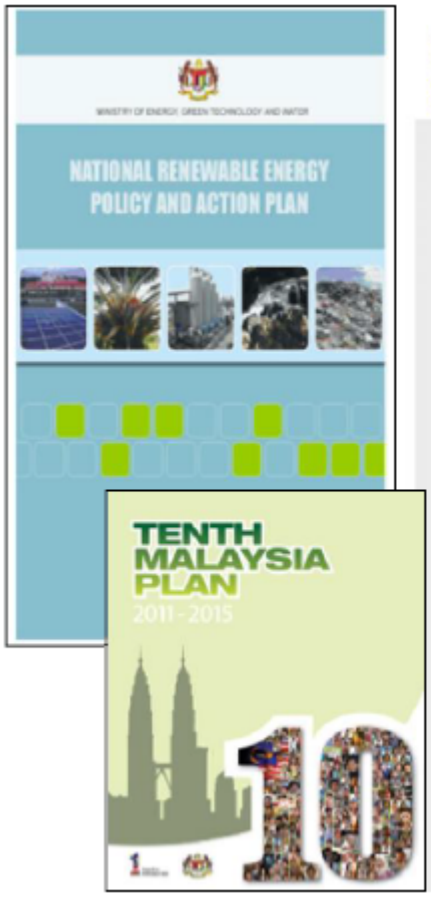
- It is unlikely that domestic oil and gas production will grow substantially beyond current levels, as the oil and gas discoveries from the mature basins are, on average, smaller than in the past.
- Oil and gas production in Malaysia is likely to decline by 1 to 2% per year on average in the coming decade.
- Malaysia is going to need more energy as the economy continues to grow: 6 GW of new generation capacity is expected to be needed by 2020.
- The power sector faces a major challenge as declining gas production will have an impact on the power generation industry. Currently, 58% of power generation in Malaysia is based on natural gas, with the remainder coming from coal (37%) and hydro (5%).
- Malaysia is among the countries with the fasted growing carbon emissions!

Malaysian National RE Policy

- The Malaysian Government has put a legal framework in place and formulated clear initiatives regarding Renewable Energy.

GOVERNMENT OF MALAYSIA

Target: 5.5% renewable energy by 2015

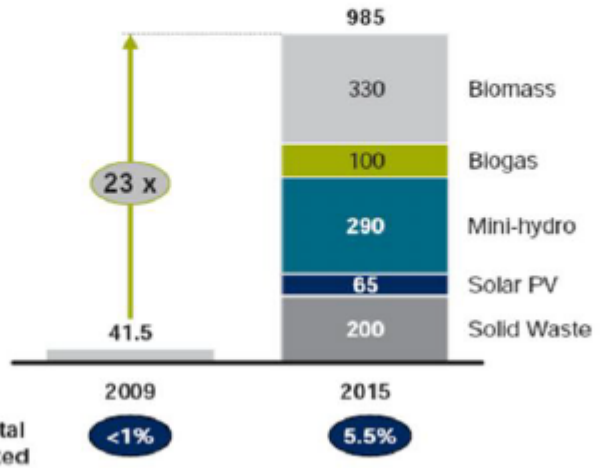


Renewable energy will increase from <1% in 2009 to 5.5% of Malaysia's total electricity generated by 2015

Moving towards renewable energy replaces the need for fossil-fuel power plants

Planned increase in renewable energy capacity

MW



RE investments will receive a huge push through FiT

- **Introduction of Feed-in Tariff (FiT) of 1%** to be incorporated into the electricity tariffs of consumers
- **Establishment of a Renewable Energy Fund** from the FiT to be administered by a special agency under KeTTHA
- This provides an **annual CO_2 avoidance** of 3.2 million tonnes

7

SOURCE: Ministry of Energy, Green Technology and Water

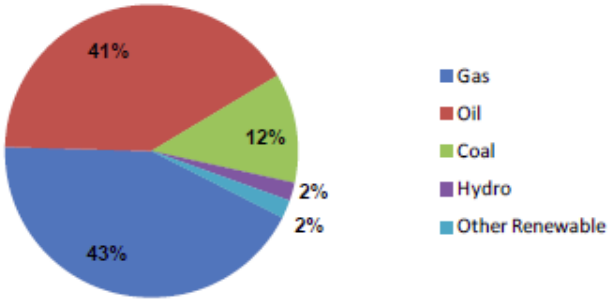
Outlook for Renewable Energy

Malaysia – 20 percent RE by 2020

Policy Aspirations

- 8th Malaysia Plan declaring RE as 5th Fuel
- 2011 creating viable feed-in-tariff for all REs
- SREP (Small RE Power) Program
- Rural electrification
- € 370m soft loans for local firms supporting
- green - tech
- Promote R&D on solar, hydro and systems

Malaysia's Energy Mix



Barriers & Prospects

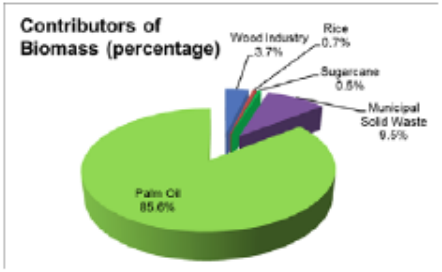
Greatest Barriers

- Financial – governmental side movement
- Banks not willing to finance RE (yet)
- Implementation of feed-in tariff

Brightest Prospects

- On-grid solutions in biomass and solar
- Off-grid solutions in rural areas
- Energy efficiency measures buildings and
- R&D basis for ASEAN

Biomass underutilised



Biomass 27 mill. tonnes / year

Solar in it's infancy

Installed solar insignificant

No. 3 in Solar cell manufacturing
aiming for 23GW by 2020

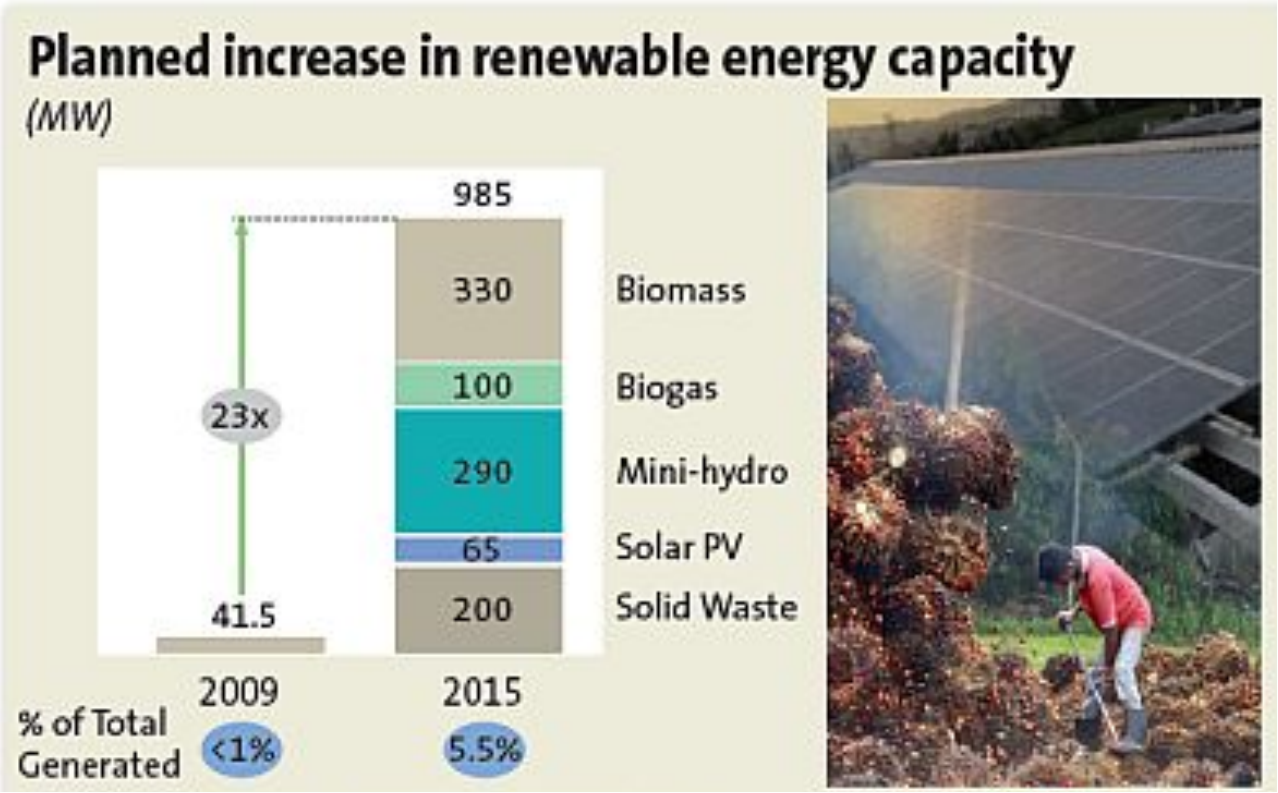
RE sectors in Malaysia

- 5 RE sectors offer attractive opportunities. Wind power is not an option.

Solar	Biomass	Biogas	Mini-Hydro	Solid Waste
				
Potential: > 6,500 MW (40% buildings)	**Potential:** 1,340 MW by 2030	**Potential:** 410 MW by 2028	**Potential:** 490 MW by 2020	**Potential:** 360 MW by 2022
Status: 1 MW -MBIPV Project (SURIA 1000, Demo, Showcase Incentives & SURIA for Developers) -yearly average irradiance 1,400-1,900 kWh/m^2	-Status: Total 39 MW under Construction as of July 09 - Biogen Project - Palm Oil waste (EFB), other agricultural waste (woodchips, padd y husks, etc)	-Status: Total 4.45 MW under Construction as of July 09 - Palm Oil Mill Effluent (POME), Cassav a waste, livestock, agro, industrial waster water	-Status: Total 30.3 MW under Construction as of July 09 - Run of the river with minimum impounding	-Status: Total 5.5 MW Commissioned on 1 August 2009 - waste collected in Malaysia Approximately 21,000 tonnes/day

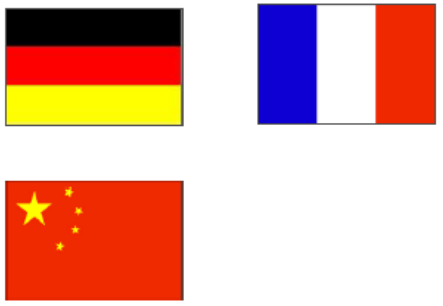
RE sectors with the most opportunities

- An overview of the RE sectors with the most opportunities for European companies

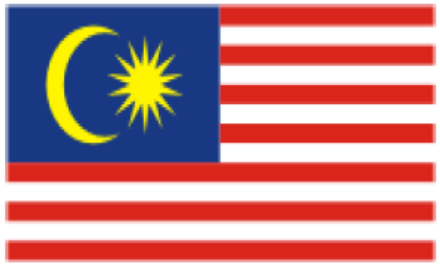


Photovoltaic systems will present the largest opportunities

- Malaysia still lags far behind in terms of FiT-share of renewable energies and photovoltaic



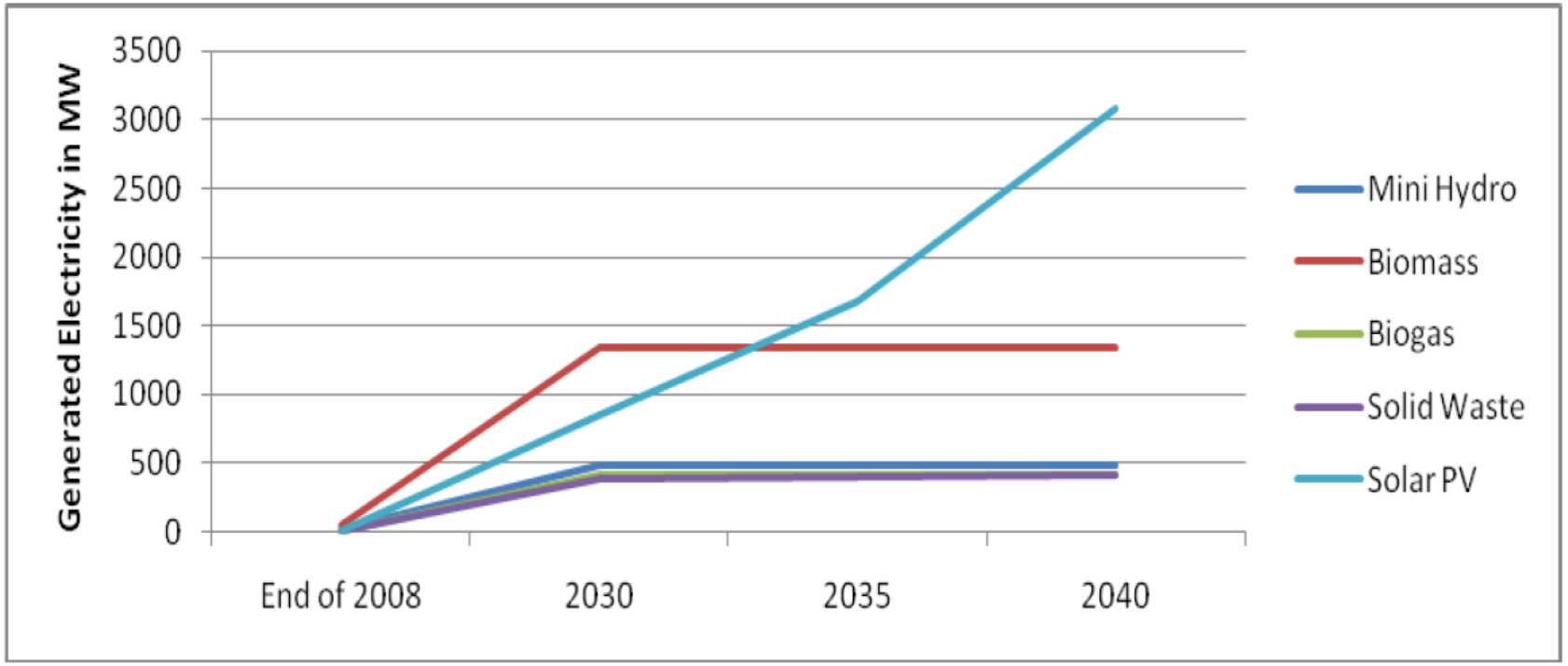
FiT-Share of renewable energies and photovoltaic in energy portfolio (2010) >10%



Share of RE (2010) <1%
Share of PV (2010) = 0.00004%
To be increased through introduction of FiT.

RE sector development in comparison

- PV will see a steady increase and be the most relevant form of renewable energy after 2030.



Cumulative Renewable Energy Generation

- Up to 2020 all RE sectors present opportunities for companies in this field. Thereafter PV is the growth engine.

Year	Cum Biomass (MW)	Cum Biogas (MW)	Cum Mini-Hydro (MW)	Cum Solar PV (MW)	Cum SW (MW)	Cum Total RE, Grid-Connected (MW)
2011	110	20	60	9	20	219
2015	330	100	290	65	200	985
2020	800	240	490	190	360	2,080
2025	1,190	350	490	455	380	2,865
2030	1,340	410	490	1,370	390	4,000
2035	1,340	410	490	3,700	400	6,340
2040	1,340	410	490	7,450	410	10,100
2045	1,340	410	490	12,450	420	15,110
2050	1,340	410	490	18,700	430	21,370

Critical issue: Feed-in-Tariff terms

- The initial terms for FiT in Malaysia are not deemed to be attractive enough. Time will change that.

Technology / Source	FiT Duration	Range of FiT Rates (RM/kWh)	Annual *Degression*
Biomass (palm oil waste, agro based)	**16**	**0.27 – 0.35**	**0.5%**
Biogas (palm oil waste, agro based, farming)	**16**	**0.28 – 0.35**	**0.5%**
Mini Hydro	**21**	**0.23 – 0.24**	**0%**
Solar PV & PP	**21**	**0.85 – 1.78**	**8%**
Solid waste & Sewage	**16**	**0.37 – 0.45**	**1.8%**

Summary

- Malaysia recognizes the need for increased RE.
- Legal framework and financial support is available.
- European companies will find ample opportunities in all RE sectors, especially photovoltaic.
- Malaysia furthermore offers opportunities in all industrial and service sectors.

Please contact us to explore growth possibilities for your business:

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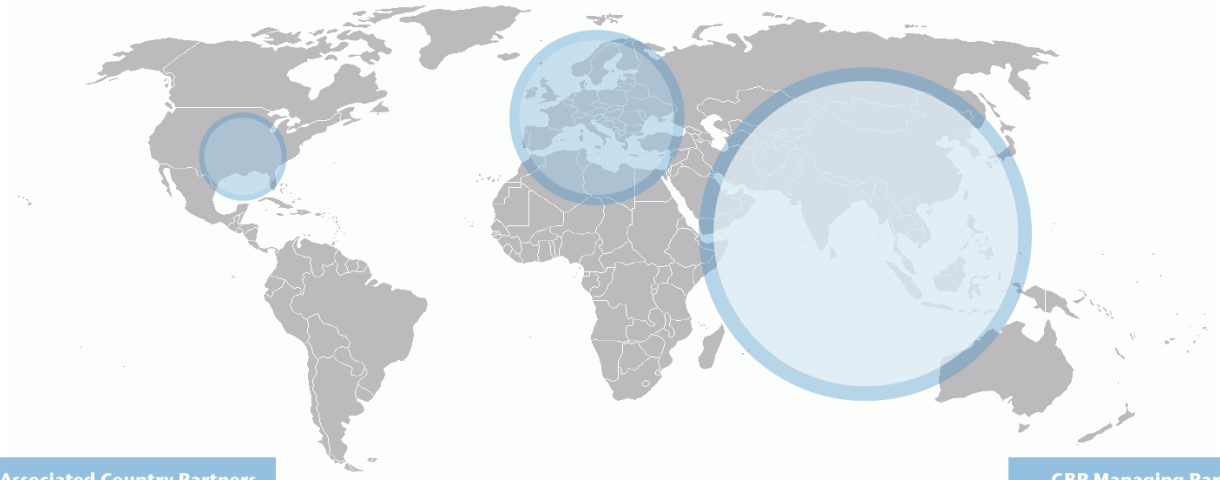

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