Energy Efficiency and CDM Projects

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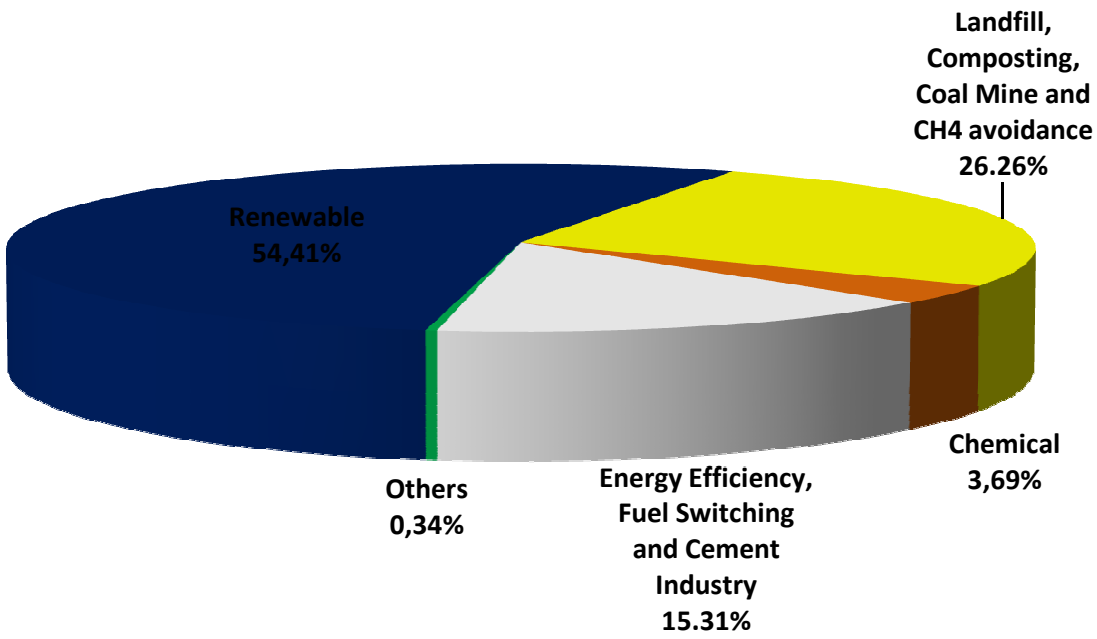
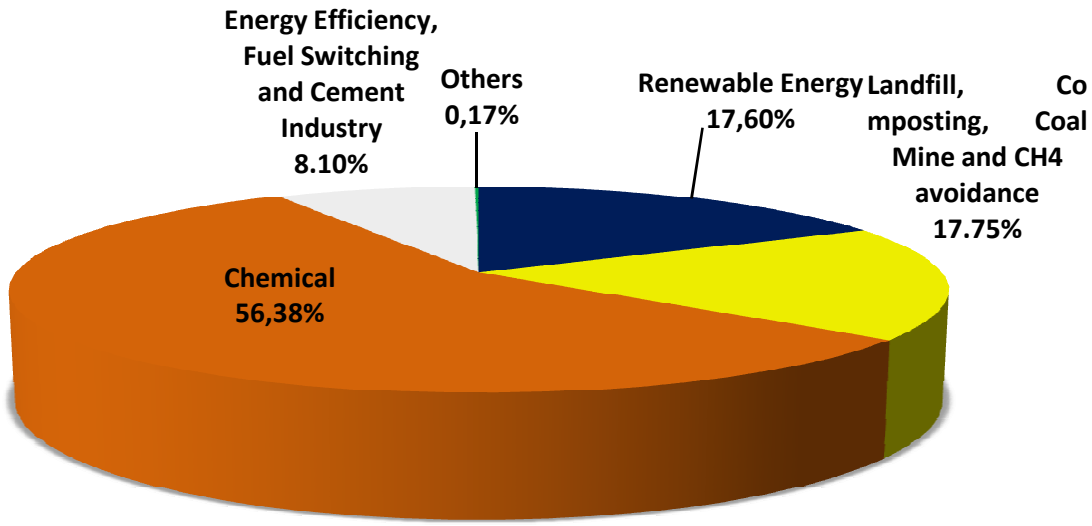
REGISTERED CDM PROJECTS

Number of CDM Projects by type

945 Registered Projects



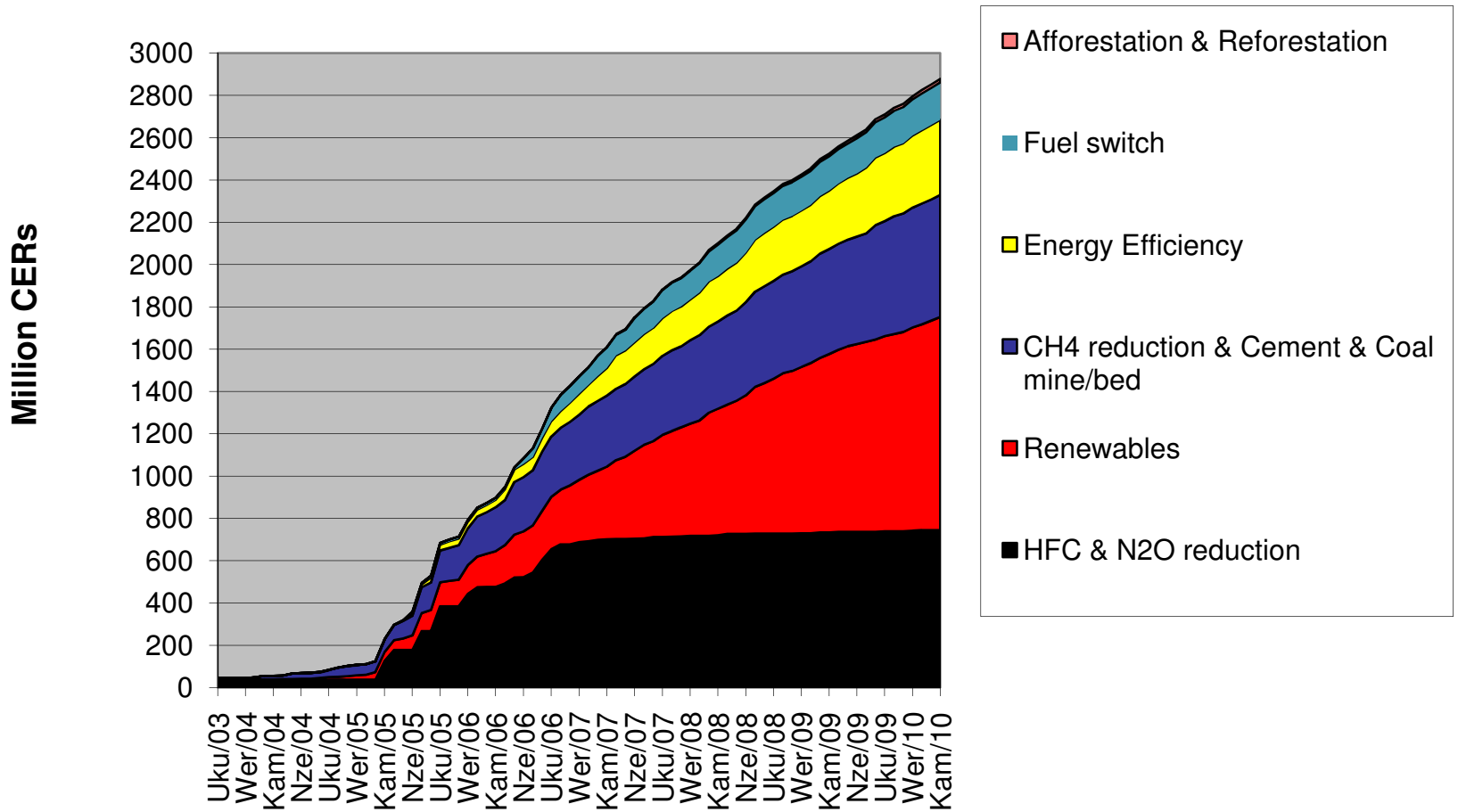


CERs to be generated by type

1,170,000,000 from Registered Projects

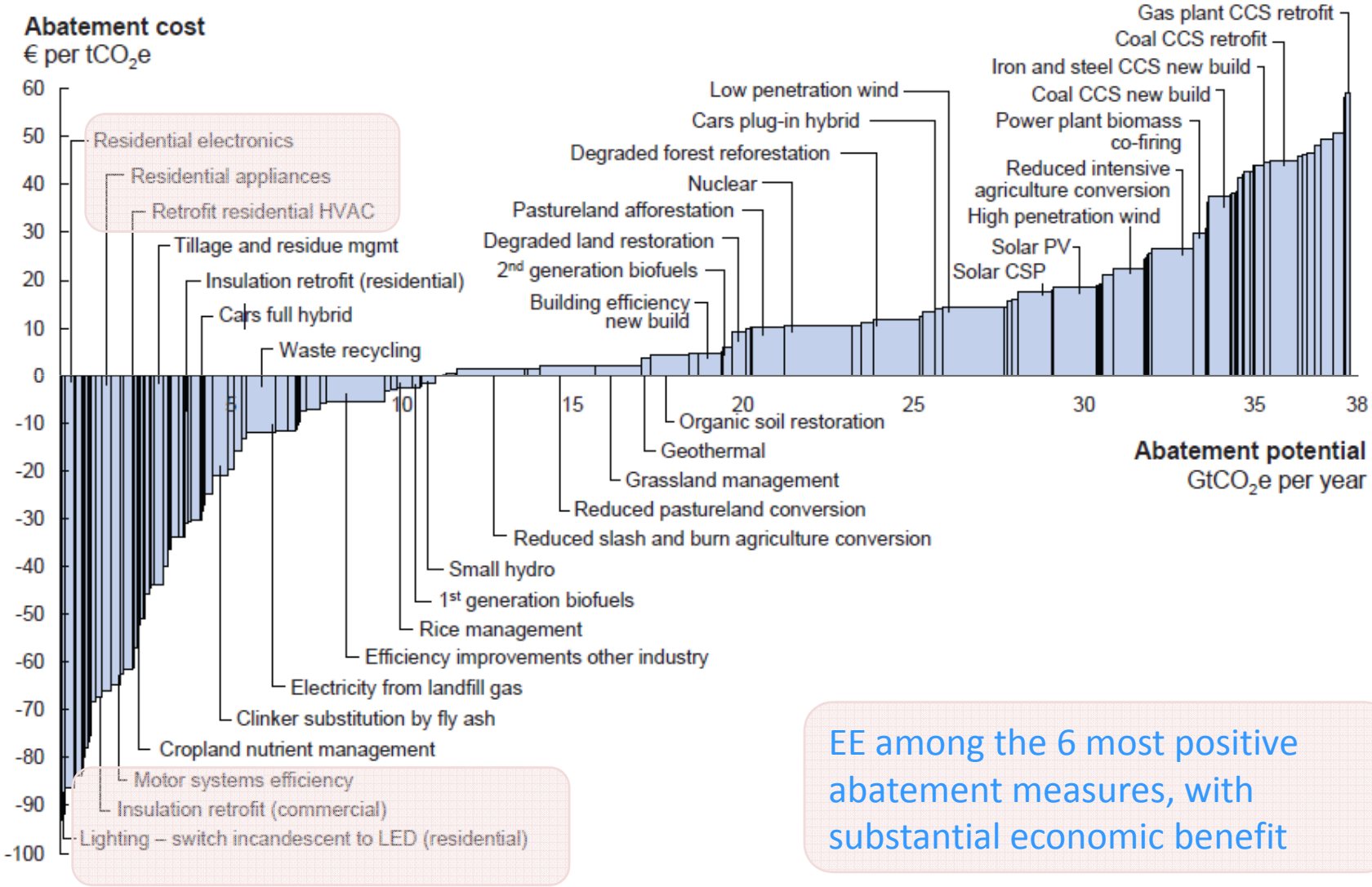
Source: UNFCCC and UNEP

Growth of total expected accumulated 2012 CERs



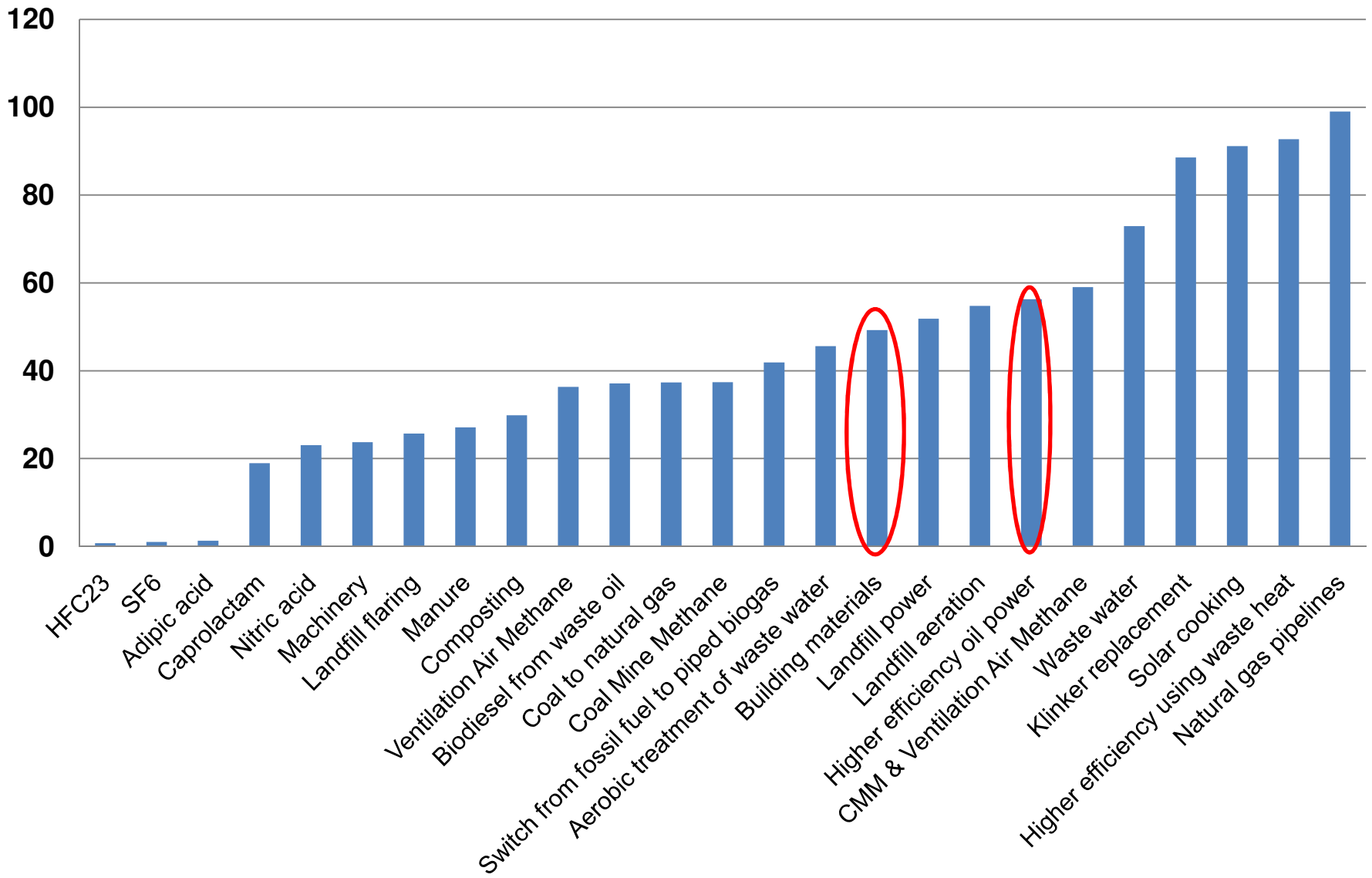
Energy Efficiency

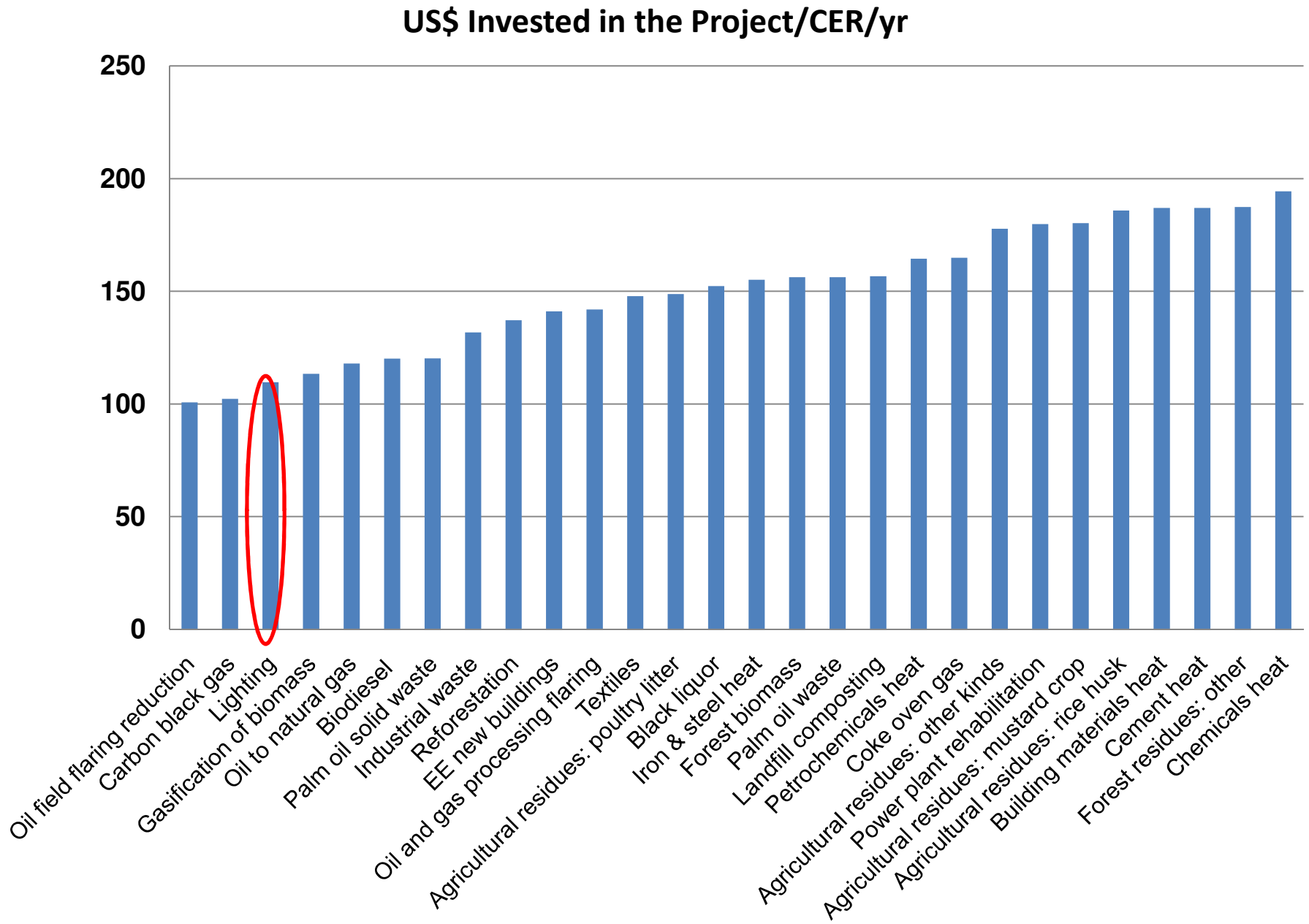
Mc Kinsey CO2 Abatement Cost Curve



EE among the 6 most positive abatement measures, with substantial economic benefit

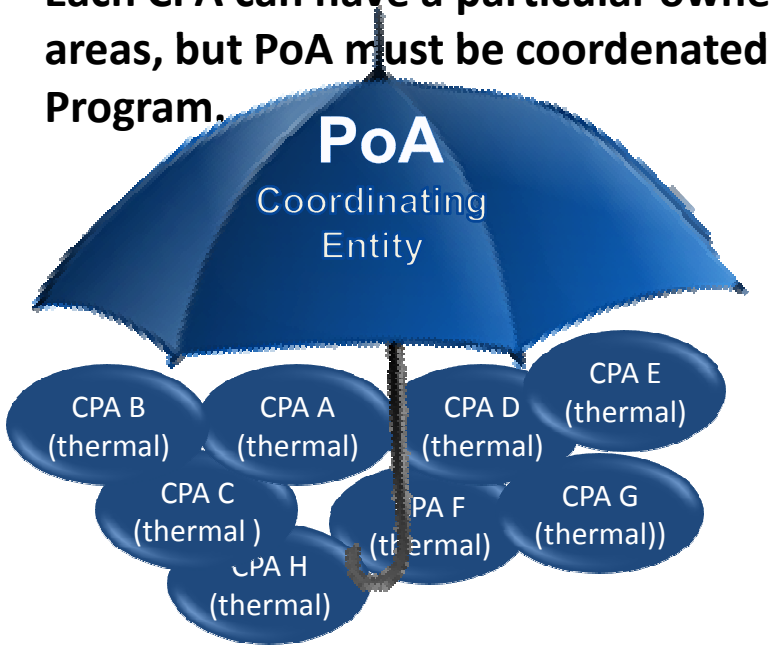
Source: McKinsey, 2009


US$ Invested in the Project/CER/yr
120
100
80
60
40
20
0
HFC23
SF6
Adipic acid
Caprolactam
Nitric acid
Machinery
Landfill flaring
Manure
Composting
Ventilation Air Methane
Biodiesel from waste oil
Coal to natural gas
Coal Mine Methane
Switch from fossil fuel to piped biogas
Aerobic treatment of waste water
Building materials
Landfill power
Landfill aeration
Higher efficiency oil power
CMM & Ventilation Air Methane
Waste water
Klinker replacement
Solar cooking
Higher efficiency using waste heat
Natural gas pipelines


US$ Invested in the Project/CER/yr
250
200
150
100
50
0
Oil field flaring reduction
Carbon black gas
Lighting
Gasification of biomass
Oil to natural gas
Biodiesel
Palm oil solid waste
Industrial waste
Reforestation
EE new buildings
Oil and gas processing flaring
Agricultural residues: poultry litter
Textiles
Black liquor
Iron & steel heat
Forest biomass
Palm oil waste
Landfill composting
Petrochemicals heat
Coke oven gas
Agricultural residues: other kinds
Power plant rehabilitation
Agricultural residues: mustard crop
Agricultural residues: rice husk
Building materials heat
Cement heat
Forest residues: other
Chemicals heat

Programmatic CDM

- **Programatic CDM is organized according with general rules of CDM. But, different to "bundling", when presenting the project for registration, it is not required to list all operational and actors that will participate in the project.**
- **A Program of Activity (PoA) can be understood as an umbrela project and the emission reductions are accounted at the level of each CDM Program of Activity (CPA).**
- **Each CPA can have a particular owner, must cover different geographical areas, but PoA must be coordenated by only one management unit for the all Program.**



Applicability: aggregate similar projects (using the same technology) not yet identified and that will be implemented during the lifetime of PoA.

Programmatic CDM

"Programmatic CDM" project activities are the result of a "deliberate program," whether it is a public sector measure (voluntary or mandatory) or private sector. For example, the program could be a soft loan program for renewable energy.

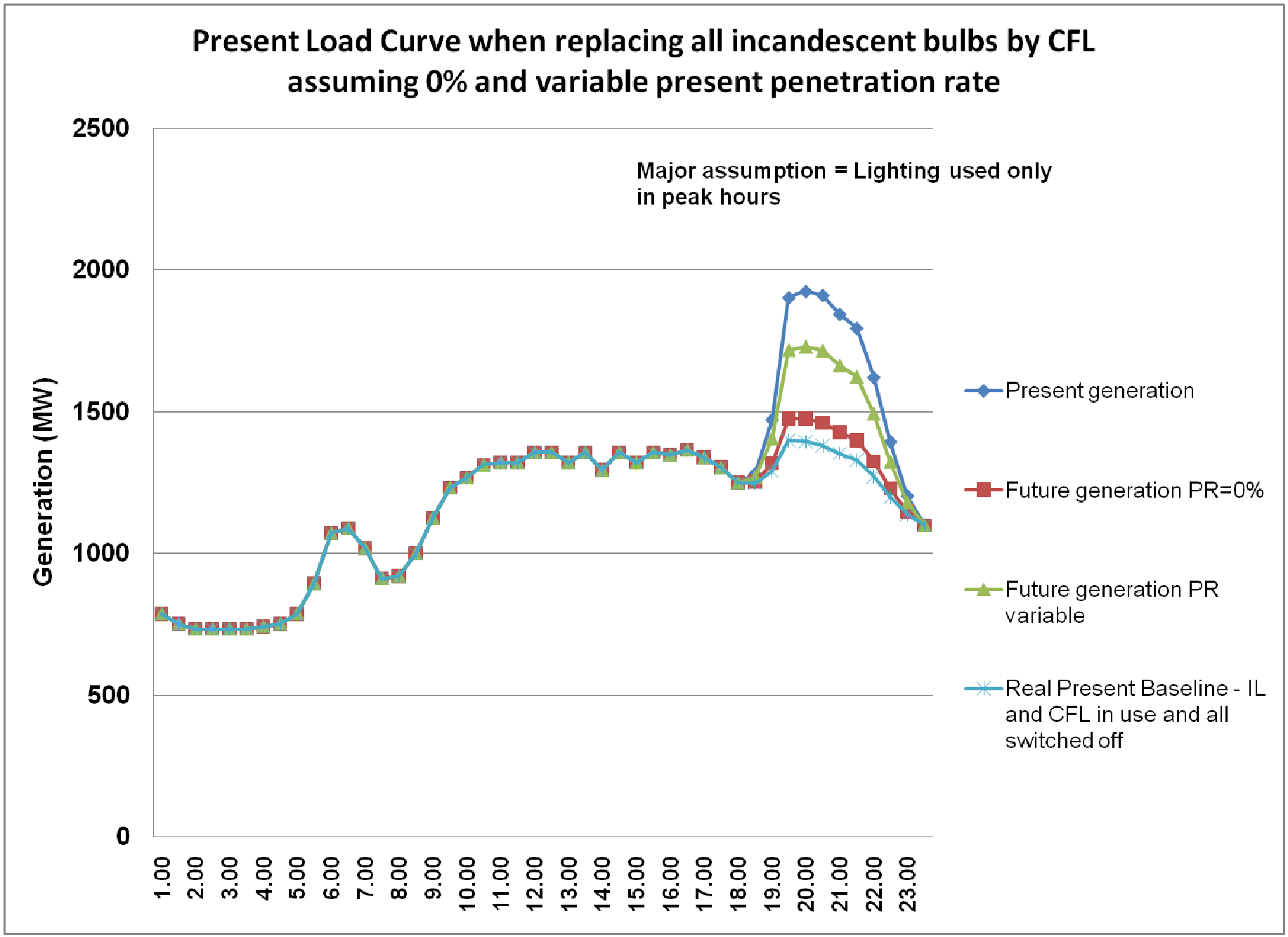
Key characteristics of a "programmatic CDM" project are the following:

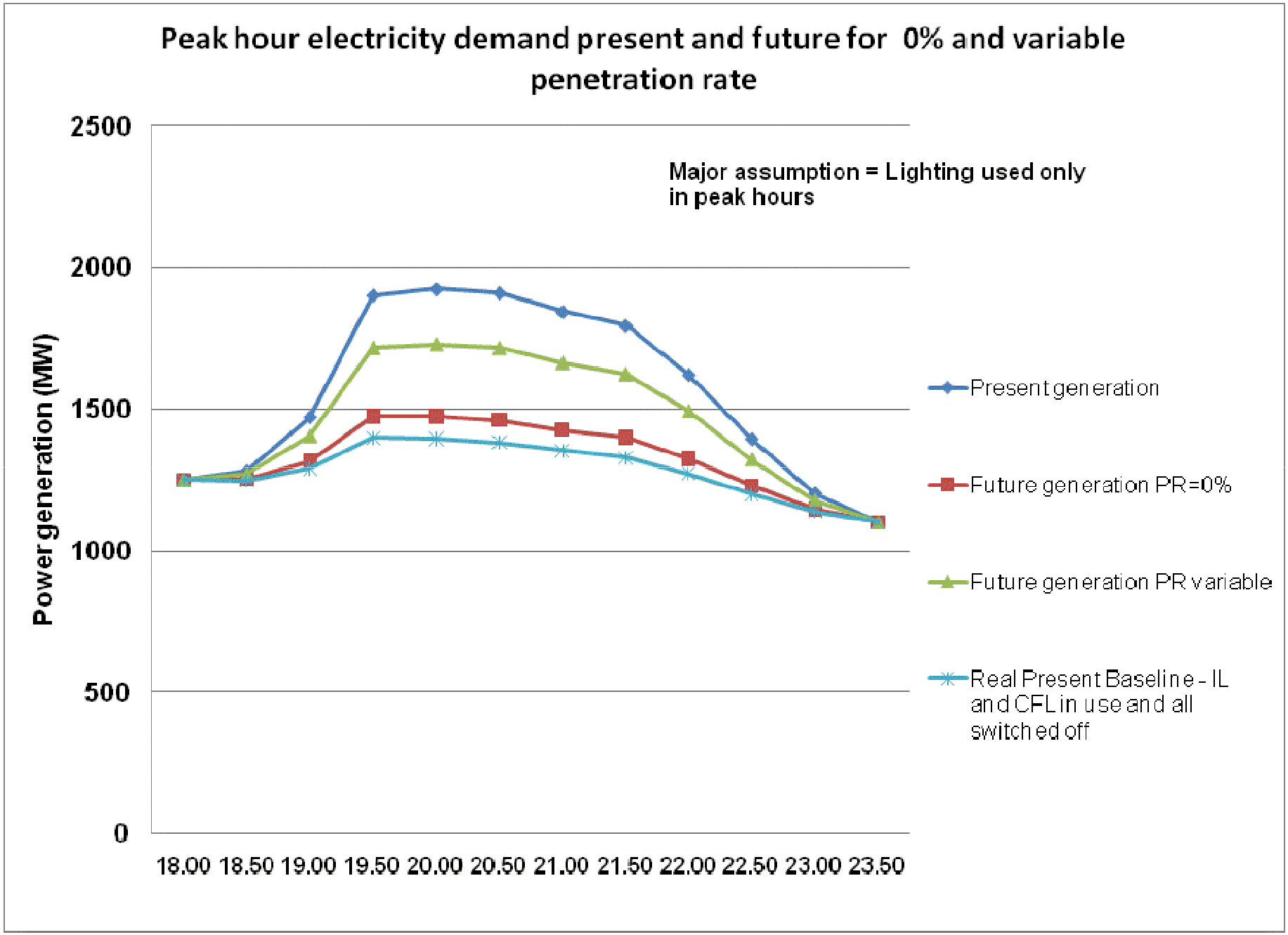
- **The program results in a multitude of dispersed actions. Response to the program occurs at multiple sites and amongst a variety of actors (e.g., an appliance effic. program - an individual consumer receives a subsidy for upgrading their appliances)**
- **The activities and resulting emission reductions do not necessarily occur at the same time, but do respond to the same program. For example, some reductions may occur early in implementation of the program, while others may occur later.**
- **The type, size, and timing of the actions induced by the program may not be known at the time of project registration; however, they are identified ex-post, attributable to the program, and verifiable.**
- • **The project is submitted using one single Project Design Document.**

Lighting Efficiency Project
Sri Lanka

Jose Roberto Moreira

August 5, 2010


Present Load Curve when replacing all incandescent bulbs by CFL assuming 0% and variable present penetration rate
Major assumption = Lighting used only in peak hours
Generation (MW)
2500
2000
1500
1000
500
0
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
10.00
11.00
12.00
13.00
14.00
15.00
16.00
17.00
18.00
19.00
20.00
21.00
22.00
23.00
Present generation
Future generation PR=0%
Future generation PR variable
Real Present Baseline - IL and CFL in use and all switched off

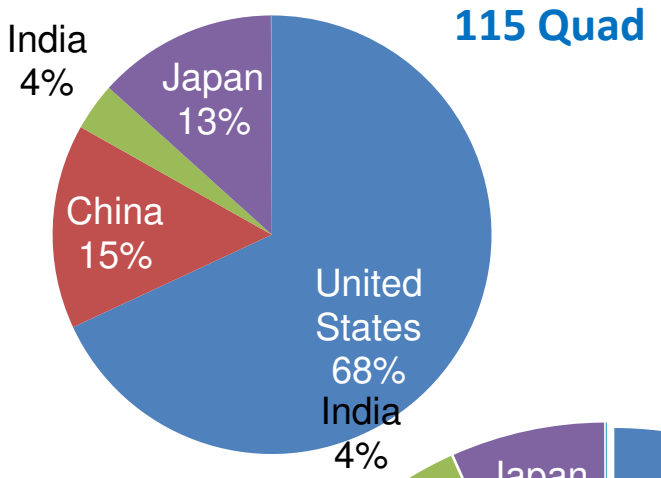

Peak hour electricity demand present and future for 0% and variable penetration rate
Major assumption = Lighting used only in peak hours
Power generation (MW)
2500
2000
1500
1000
500
0
18.00 18.50 19.00 19.50 20.00 20.50 21.00 21.50 22.00 22.50 23.00 23.50
Present generation
Future generation PR=0%
Future generation PR variable
Real Present Baseline - IL and CFL in use and all switched off

PROJECT INDICATORS

Demand Reduction on Peak Hours	200 MW
Number of CFLs distributed to consumers	7 millions
Total cost of EE plan without CER	Rs$ 2.8 billion
Total cost of EE plan with CER	Rs$ 3.9 billion
Total net cost EE with CER	Rs$ 1.2 billion
Total amount of electric. Saved	15 GWh/month
Total amount of subsidy avoided	Rs$ 0.6 billion/month
Investment on supply avoided	Rs$ 0.11 billion/MW
Total investment on supply avoided	Rs$ 22 billion
Total extra supply addition from subsidy	Rs$ 5 MW/month

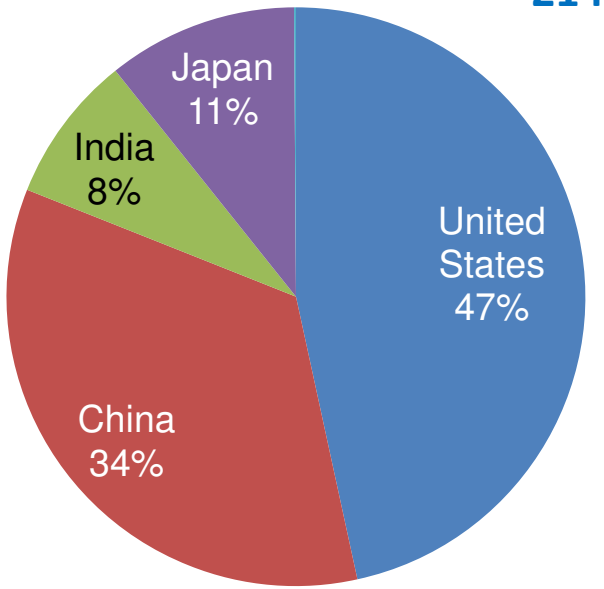
First Program Stage	1 million CFLs
Total net cost with CER	0.2 billion

Primary Energy Consumption for USA, China, India, and Japan by 1980

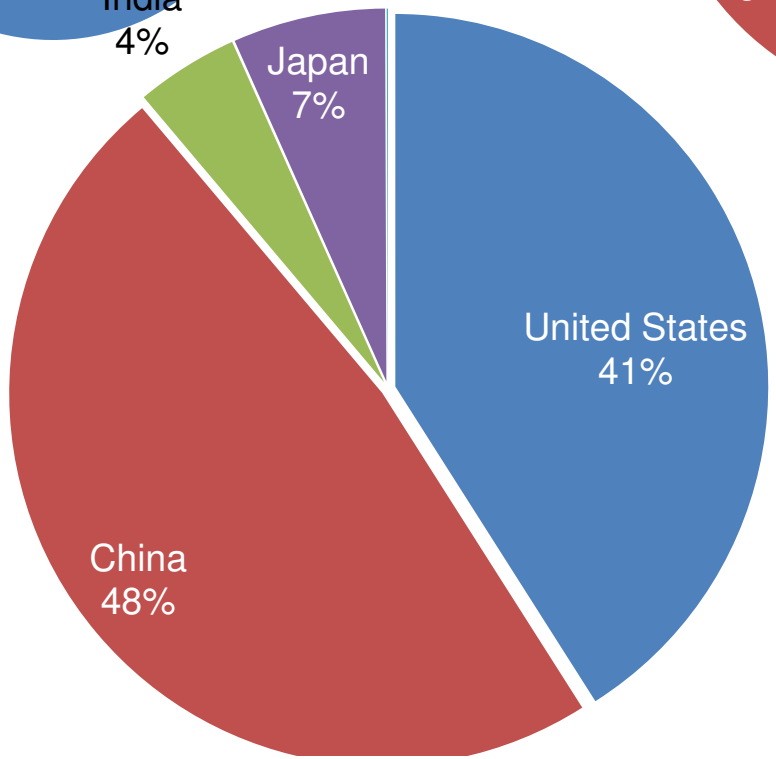


115 Quad

Primary Energy Consumption for USA, China, India, and Japan by 2006



214 Quad



417 Quad

Prmary Energy Consumption for USA, China, India, and Japan by 2006 with 1980 energy intensity