

# **Suppressed demand:** a stakeholder perspective

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Project:

- Set up an expert working group on suppressed demand (2010);
  - ABCD
  - Animation of an expert working group
  - Development of a joint position paper
  - Project developers, meth/development experts
- ► Conducting case studies (2011)
  - Ceramic Water Purifiers Cambodia
  - Passive Solar Homes India
  - Household Biodigesters Vietnam
- ► Financially supported by CDC climat.



# Simultaneously expanding basic services and de-carbonizing.

- Still billions without access to electricity, clean cooking fuels, safe water and sanitation:
  - 20% of world population without electricity
  - 40% reliant on biomass for cooking
- Current actions falling short both in terms of scale and pace
- With current trends, more people will be without modern energy access in 2030 than today
- CDM has the twin objectives: reducing emissions and contributing to sustainable development objectives.
- Powerful mechanism for mobilizing capital.



The SSC WG notes

- "particularly in the context of LDCs/SIDs and economically restricted regions of developing countries, over reliance on historical data results in very low emission baseline scenarios with consequent disregard for the latent demand for energy and other services (e.g. transport, waste treatment) that exist. It is also noted that an assumption of **continued supply of low/poor quality services** throughout the 7 or 10 years of crediting period, as these countries/regions develop, **may** not align well with the development aims of CDM. In addition, such low baseline levels may result in such insignificant levels of emission reduction estimates from renewable energy and energy efficiency projects that carbon credit revenue has a marginal or negligible impact."
- CDM SSC WG Twenty-seventh meeting report Annex 7 Page 1: Treatment of increase in future anthropogenic emissions of host country



(SCWG guidance):

- Where services are unavailable to meet the basic human needs?
- Where a service was previously available to an inadequate level?
- Where a service is currently provided with a resource that is assumed to result in no emissions.

Missing:

- Indicators of `adequate' service?
- Definitions ?



- Historical energy consumption looking at past usage patterns - is not an accurate or reliable proxy for future energy demand.
- Demand suppressed due to a lack of income, lack of access and high unit cost of services and technologies
- "income effects" and "price/access effects"
- Baseline established not by current consumption levels but by making a 'choice' about where the service levels should be...
- Not just cutting existing emissions but avoiding future emissions
- Using a project activity service level has major limitations
- difficult to measure service directly
- and may not initially reflect "adequate services"





Source: Matt Spannagle UNDP 2010



# Suppressed demand emissions



Source: Matt Spannagle UNDP 2010



#### The woodfuel burden







#### Typical kithen setting





#### Small scale industries





#### **Productive opportunities**





#### Pollution





- Realignment of the CDM as a development mechanism
- CDM irrelevant to billions of people that lack access to the most basic services
- Drive access to energy and other essential services while decarbonising simultaneously
- Improving regional distribution of the CDM and increase its relevance
- Crediting for predictable rises in emissions and therefore...avoid future emissions and to leapfrog to cleaner technologies and development pathways



- A `case-by-case' meth by meth approach
- There are inconsistencies and omissions in present treatment of suppressed demand in methodologies
  - AMS IJ: new construction projects, the baseline system and fuel source (fossil fuel or electricity) assumed....is demonstrated to be typical of new construction. (Fuel type and quantity)
  - AMS IE and IG: the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs. (Fuel type only)
  - AMS III AV: assumed that fossil fuel or non renewable biomass (NRB) is used in the absence of the project activity. Baseline is the fuel consumption of the thermal application used or that would have (fuel type only and includes biomass)
  - AMS I.I: baseline is the fuel consumption of the thermal application used or that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced. (fuel type and quantity)
- A process of harmonizing approaches is required, in particular with standardized baselines.



- i. A general policy recognition "general meth framework"
  - application of suppressed demand and
  - emissions avoidance approaches
- ii. Approval of eligible sectors and assessment methods
- iii. Harmonize approaches
- iv. **Restrictive criteria and caps** to be applied to maintain conservativeness and realistic expectations of growth and alternative provisioning.
- v. Simplified mechanisms for MRV and "groundtruthing" assumptions



#### 1. Minimum Service Level (MSL) default values (e.g. water filters)

- Requires a political decision...?
- Derived from international peer reviewed research...and political acceptance?
- Derived from national policies or requirements?
- Periodically evaluation
- Over a long term time horizon, MSL's will always be reached (with rare exemption, such as protracted conflict or regional/global economic collapse) and therefore the approach of MSL is valid?
- E.I. can be assured by benchmarking with rises in emissions implicit with achievement of international development goals in terms of consumption/service level and technologies?
- 2. Immediate uptake of satisfied demand: Use project level of service and expected fuel use as a baseline, if demand is immediately satisfied (e.g. solar water heaters).
- **3.** Slow uptake of satisfied demand: Sector specific predictive tools to accurately and conservatively estimate the level of attained energy service i.e. satisfied demand level benchmarked with the MDG's and capped at a maximum in instances where consumption/emissions are shown to be increasing over time and are predicted to exceed MSL's.

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## **Issues:**

- CDM = panacea for all development issues?
- What are the basic services for human needs?
- Defining a level of satisfied or adequate service?
  - Political decisions...
  - Technology and fuels used;
  - Consumption level; and
  - Energy service level
- What is the timeframe of analysis for "expected increased in future emissions"?
- Does the "satisfied service level" progress alongside wider technological, social and economic development?
- MRV and environmental integrity of the emissions reductions?
  - Implication of basic rights and therefore a right to an emissions level?
- Restrictive criteria for the application of suppressed demand
- ► Governance:
  - Should this (and how) be linked with current plans in the sector?
  - Should DNA's provide information on access and services and country level plans?
- Additionality? Would likely happen anyway but now with different tech/fuels.....??



- Specific approval and policy recognition of suppressed demand in CDM projects;
- Approval of eligible sectors dealing with basic needs;
- An acceptance that pre-established Minimum Levels of Service (MSL) can be used as default values for minimal future increases in emissions;
- An acceptance that simple predictive tools can be used to estimate satisfied demand - the development of sector specific predictive menu of tools by expert groups and open to all.



Thankyou!

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#### Part 2: case study of suppressed demand in a project



# Suppressed demand project types:

- -Ceramic Water Purifiers (CWP)
- -Improved Cooking Stoves (ICS)
- -Passive Solar homes (PSH)
- Off-grid renewable rural energy solutions

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#### **Ceramic water purifiers (Cambodia)**

The reality for most Cambodians is that they must collect water, store it for use in the household, and treat and protect it themselves if they are to have safe water.

Problem context:

- Waterborne diseases, in part due to degraded drinking water sources, are a major public health issue: Cholera, Dengue, and diarrheal diseases.
- Low access to safe water in rural areas: 66% (>without consistent safe water)
- Most water sources suffer fecal contamination
- Lack of awareness and availability of sanitation solutions: 16%
- ► High costs of and low access to treated water
- Carbon stock depleting rapidly
- Use of biomass for boiling contributes to IAP and imposes significant costs

Methodology: AMS III. IV











- ► The right to water exists at the level of the individual
- ▶ Implies access to the minimum necessary for basic needs.
- No one should be denied water for life because of an inability to pay
- ▶ WHO estimates basic needs at 7.5 lppd
- Progress towards universal achievement of this level of service is associated with substantial health gain.
- In practice, the use of water for domestic purposes cannot easily be distinguished from productive use at the household level
- Within the population served by basic levels of service, gains are primarily achieved through;
  - Providing protected water sources,
  - Promoting good water handling hygiene practices and;
  - Household treatment of water
  - Other key hygiene behaviors (notably hand and face washing) at critical times.



Proposed solution:

- POU treatment
- Locally produced
- Zero energy input required (gravity powered)
- Lightweight, portable, relatively inexpensive, chemical free, lowmaintenance, effective, and easy to use
- Product designed for low income setting with un-improved water sources
- Significantly improve household water quality (up to 99.99% less E. coli)
- Effective in reducing the burden of diarrheal disease

Project;

- Access to replacement filters and spare parts is key to ensuring longterm success
- Cost recovery is positively associated with continued use
- Usable lifetime of between 2-5- years with life time guarantee for replacement parts
- Disseminate between 50-100k per year in rural areas
- CWP does not necessarily improve access, but water quality risk reduction.
- Filters may be used longer and more effectively by households when other water, sanitation, and hygiene (WSH) interventions are bundled with the CWP;

Ceramic water purifiers (Cambodia): historic baseline scenario

- ► Fuels: wood (90%, fNRB ≈50%) and biomass residues (6%) and LPG (<1%)</p>
- ► Consumption : 2 lppd
- Treatment: 'regular water boiling' as a method of treatment (70%)
- ► 26% do not have any treatment practice.
- Appliances: use inefficient traditional stoves (60%), 3 stones (10%) or ICS (30%).
- > 12% of household expenditure on energy

#### Baseline shows suppressed demand for:

- ► Fuel type strong migration toward other fuels over time
  - Biomass residues -> charcoal and LPG
  - Wood -> charcoal and LPG
  - Charcoal -> LPG

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- Fuel switch drivers (price, access, functionality, urbanization, status)
- Fuel quantity: baseline service level demand is suppressed due to
  - costs associated with baseline fuels (collection time and effort; IAP; and if bought, price relative to income)
  - insufficient boiling (<5 minutes rolling boil)</li>
- Water consumption: < 2 lppd (sometimes unclean or improperly treated)
- Water boiling practice: 26% of people do not treat water at all.



#### **Income and fuel/appliance types:**



# Dealing with suppressed demand: Fuel type

- Energy ladder model:
  - Lowest rung: Straw, dung, wood other biomass wastes
  - Middle rung: Charcoal and Kerosene and Coal
  - Top rung: LPG and Electricity
- ► Access, income, price and degree of urbanization are all critical
- Meth assumes 'projected fossil fuel use' i.e. substitution fuels likely to be used by similar users

"mix of present and future fuels used would consist of:

- solid fossil fuel 'Coal' (lowest in the ladder of fuel choices) assigned a 50% weight
- a liquid fossil fuel 'Kerosene' (represents a progression over solid fuel in the ladder of fuel use choices) assigned a 25% weight and;
- a gaseous fuel 'LPG' (represents progression over liquid fuel in the ladder of fuel use choices) assigned a 25% weight.
- ► Is this realistic, reflecting satisfied or adequate service?

#### **OCTOS** Dealing with suppressed demand: Fuel quantity

- ► Fuel quantity (MJ/day) required to boil water
- Derived from energy required to boil a liter of water on baseline appliance for 5 minutes.
- Established by the project level of service (lppd) and the NCV baseline fuels \* fNRB baseline fuels.
- Apply default values to baseline appliance efficiency (0.1 for 3 stones, 0.2 for others)

#### **Deres** Dealing with suppressed demand: Service level (liters per person per day)

- ► Baseline consumption of boiled water is ≈ 2 lppd. Well below basic requirements for safe water!
- "satisfied demand" service level taken from the project scenario i.e. treated water consumed in the project.

Questions:

- ► Water use patterns change significantly after intervention
- Capped at 5.5 lppd for accreditation?
- Why is the level capped below WHO recommended levels? What is the justification? Who recommends 7.5 lppd for basic needs.....
- Does the project level of service reflect satisfied demand (4.5 lppd)?
- Monitoring consumption is difficult!

#### **Dealing with suppressed demand:** treatment practice

- Water boiling practice: 26% of people do not treat water
- Drink contaminated water direct from collected rain, open surface sources or shallow wells.
- Given information/knowledge, time, access (financial and physical) to fuel and tools people would boil water!
- Even when water is boiled, is it done regularly and boiled for 5 minutes?
- Also significant risk of recontamination due to unsafe storage and handling of treated water.
- Assume 100% (should have been) 'proper water boilers'.





Geres Conclusions

Suppressed demand taken into account in this project through:

- Project level of service (lppd)
- Expected fossil fuel use (fuel type)
- Fuel quantity (energy required to boil for 5 minutes on traditional appliances and defaults values for appliance efficiency)
- Water boiling practice (assumption that all people would boiled water)

However:

- Is the service level achieved (4.5 lppd) meeting basic requirements? Does not impact on access to water, only on water safety.
- Why is there a cap of 5.5 lppd when basic requirement are higher?
- Is the expected fossil fuel use realistic what is the justification for this mix? Is this providing sufficient basic level of thermal energy for a household?



## Thankyou!

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