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# MRV incentives: theory and practice (the CDM experience)

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# Agenda

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- ▶ Background
- ▶ Theory: how should MRV incentives be set up?
- ▶ Practice: how MRV incentives are set up in the CDM?
- ▶ Conclusions

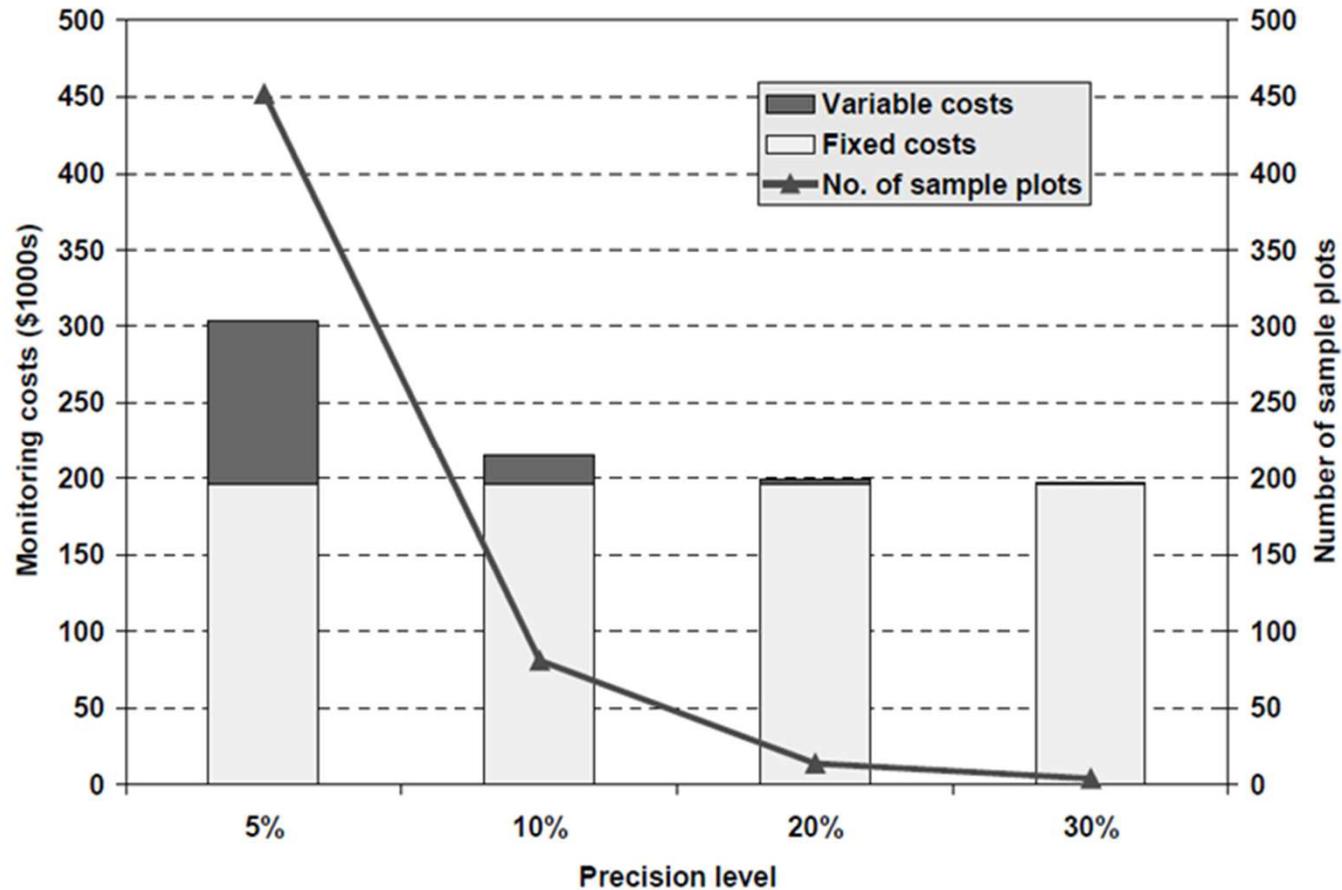
- ▶ Conventional wisdom
  - Monitoring uncertainty should be minimized
  - Conservative, e.g. through deduction of a standard deviation
  
- ▶ Thinking it through
  - Normally distributed errors balance out (large number of sources)
  - Conservativeness disadvantages smaller projects/sites
  
- ▶ The practical MRV problem
  - Better monitoring comes at a cost (major barrier in some sectors)
  - How to translate the trade-off between uncertainty and cost into MRV incentives?

# Uncertainty vs. cost

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- ▶ E.g. the cost of sampling in a forestry project



Source: OECD (2002) based on Powell (1999)

# Economic theory (1)

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- ▶ Past research has mostly focused on enforcement and compliance
  
- ▶ Not obvious why the regulator would reduce uncertainty
  - Monitoring costs and benefits trade-off (Becker 1968)
  - Market-based mechanisms: uncertainty is traded with emissions (OECD 1997)
  - Risk premium similar to insurance (Cantrell et al. 2012)
  - Information asymmetry for country baselines (Millard-Ball 2013)

## Economic theory (2)

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- ▶ Strong hypothesis are necessary to justify why the regulator should care about monitoring uncertainty (Shishlov and Bellassen upcoming)
  - Perfect information on the uncertainty range
  - AND asymmetric information on the agent's position with the uncertainty range
  - AND EITHER abatement costs proportional to real abatement rather than reported abatement (unlikely) OR agent can influence the measurement (e.g. cookstoves)
  
- ▶ It's not obvious that providing an incentive to reduce uncertainty makes good economic sense ...
  
- ▶ ... but let's assume it does, at least in some cases

# The CDM in brief

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- ▶ The CDM is the largest carbon offset mechanism
  - >7000 projects registered; >USD300 billion investments
  - >1.4 billion carbon credits issued (but the demand has dried up)
  - 200 sector-specific methodologies
- ▶ MRV of emissions reductions (vs. emissions)
  - Baseline emissions
  - Project emissions
  - Leakage
- ▶ The CDM review is under way
  - Many reforms focused on MRV: methodology consolidation, the introduction of the standard for sampling and surveys and the materiality standard, tools to calculate baselines, etc...
  - The Standard on Uncertainty is currently under development

# MRV in the CDM

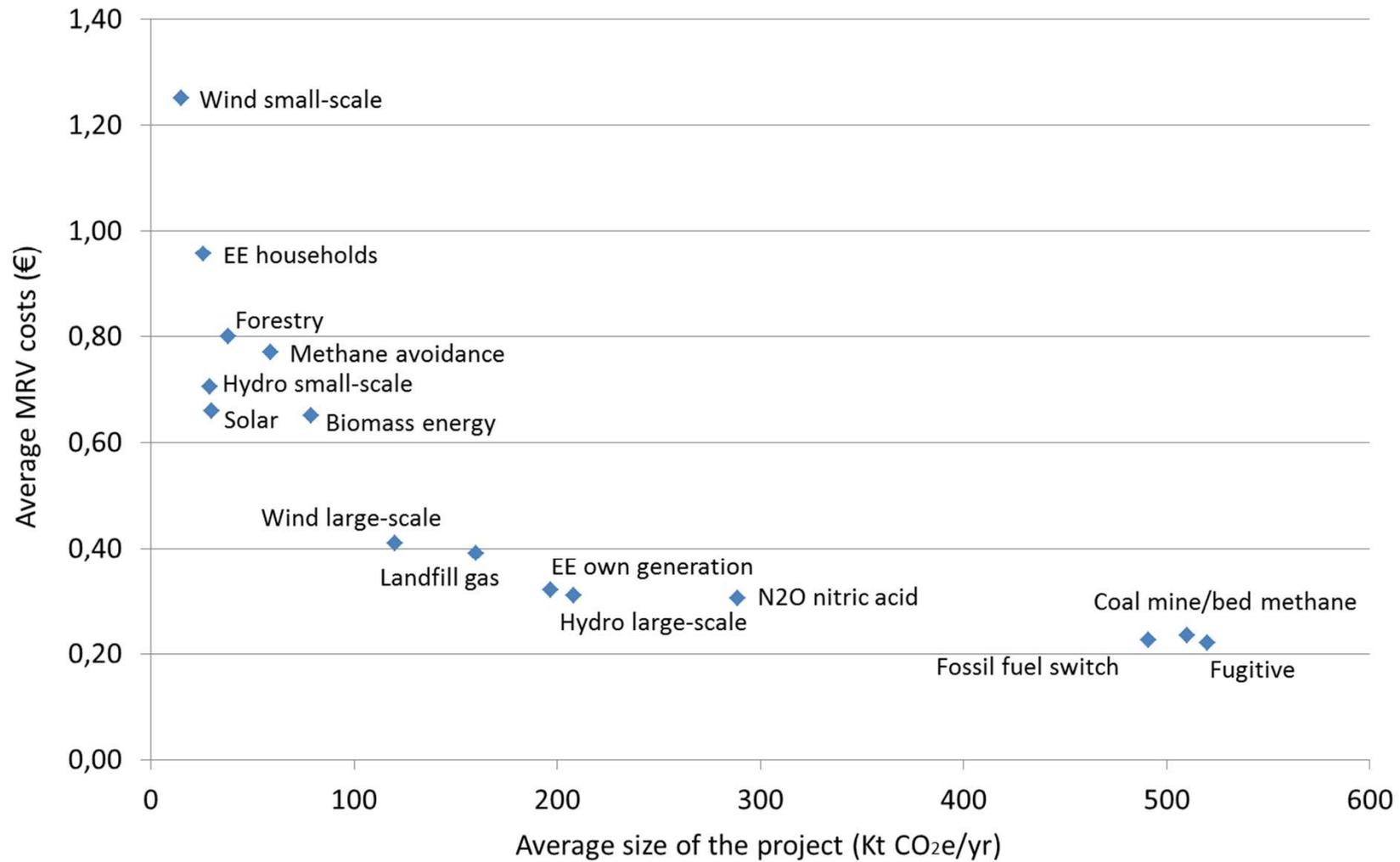
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- ▶ Conservativeness principle:
  - “Reduce bias and uncertainties *as far as is practical/cost-effective*, or otherwise use *conservative assumptions, values and procedures* to ensure that GHG emission reductions are not over-estimated”
- ▶ Uncertainty treatment:
  - *Overarching guidelines*: no reference to uncertainty for other data sources than samples and surveys
  - *Calculation tools*: uncertainty thresholds and upper/lower bounds of confidence intervals in some of them
  - *Methodologies*: implicit and explicit discounting in some of them
- ▶ MRV costs:
  - Largely depend on the size and type of a project
  - From €0.16/tCO<sub>2</sub>e for large adipic acid projects to €1.25/tCO<sub>2</sub>e for small-scale wind-power projects
  - Strong economy of scale effect

# MRV costs in the CDM

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Source: Warnecke et al. (2013); Bellassen and Stephan (upcoming)

# Uncertainty incentives

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- ▶ No incentive to reduce uncertainty in the guidelines (except for data obtained through sampling & surveys)
- ▶ Draft uncertainty standard is being examined by the EB
- ▶ An incentive to reduce uncertainty appears in some methodologies
  - *Explicitly*, through provisions to discount the number of credits in proportion to uncertainty (rare, e.g. AM0034 for N<sub>2</sub>O emissions from nitric acid production, now discontinued)
  - *Implicitly*, through a choice offered to project proponents between a conservative default value and the monitoring of a variable (e.g. AMS-II.J for compact fluorescent lamps)
- ▶ Overall, inflexible monitoring requirements hampered several sectors (e.g. transportation, efficient buildings)

# Conclusions

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- ▶ There is no generic reason for the regulator to put incentives to reduce uncertainty
- ▶ The regulator may want to do so when
  - It regulates a few large sources (e.g. national inventories)
  - Some specific configurations of asymmetrical information
- ▶ In market-based mechanisms this may be done through
  - Uncertainty thresholds
  - Offering a choice of methodologies and default values
  - Explicit discounting
- ▶ The CDM experience
  - No systematic treatment of uncertainty
  - Some sector-specific methodologies incorporate this incentive
  - MRV incentives impact emissions reductions

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Thank you!

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