



5 years N₂O monitoring in nitric acid plants

Climate Action Reserve, September 2010

Agenda

- Kyoto Market
- N.serve Environmental Services GmbH
- N₂O monitoring results from CDM & JI projects
- N₂O Monitoring: Implications for policy making & strategy

Kyoto Carbon Market

- System to trigger emission reduction projects
 - CDM: Projects in developing countries
 - JI: Projects in industrialized countries, mainly in Europe
- UN hands out credits for approved emission reductions realized under a set methodology
- Credits can be sold in the Carbon Markets (Kyoto, EU-ETS)
- Kyoto Market: driver for investment in N₂O abatement technology in nitric acid plants in developing & industrialised countries
 - Abatement catalyst (secondary or tertiary technology)
 - Monitoring equipment for continuous N₂O measurements

N.serve Environmental Services

- Leading project developer for N₂O abatement projects
- Exclusive focus on nitric acid plants
- Handle the complete implementation process of reduction projects
- Long-term partnerships, sharing of project-related risk & potential
- N.serve in Alliance with:



MITSUI & CO., LTD.



N.serve Projects

Project Partners	Country	Plants
Abocol S.A.	Colombia	3
African Explosives Ltd.	South Africa	2
Dongbu HiTek Ltd.	Korea	1
Deepak Ltd.	India	3
Fertilizers & Chemicals	Israel	1
Fertiberia	Spain	3
Gikil	Bosnia	1
GPN S.A.	France	4
Haifa Chemicals Ltd.	Israel	4
Yara International ASA	EU wide	12
Total		34
Total Emission Reductions (tCO2e)		ca. 40 million

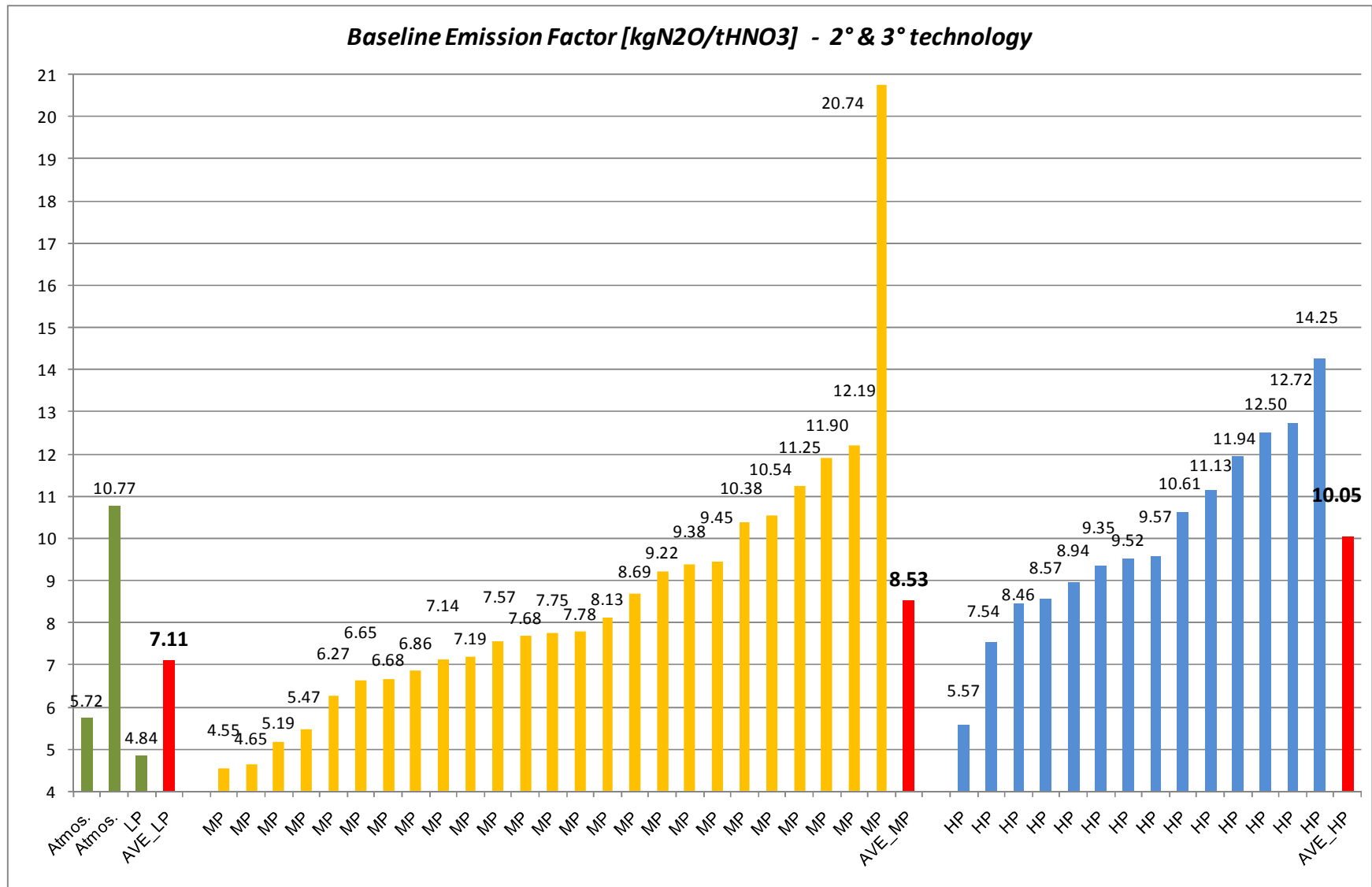
First-of-a-Kind N₂O Emission Data

- Comprehensive monitoring of emissions in N₂O reduction projects
 - Approved CDM & JI projects
 - Continuous state-of-the-art monitoring systems & standards (e.g. EN14181)
 - Third party audited
- Earlier sources for N₂O emission factors
 - Spot/sample measurements
 - Theoretical assumptions
 - IPCC default values

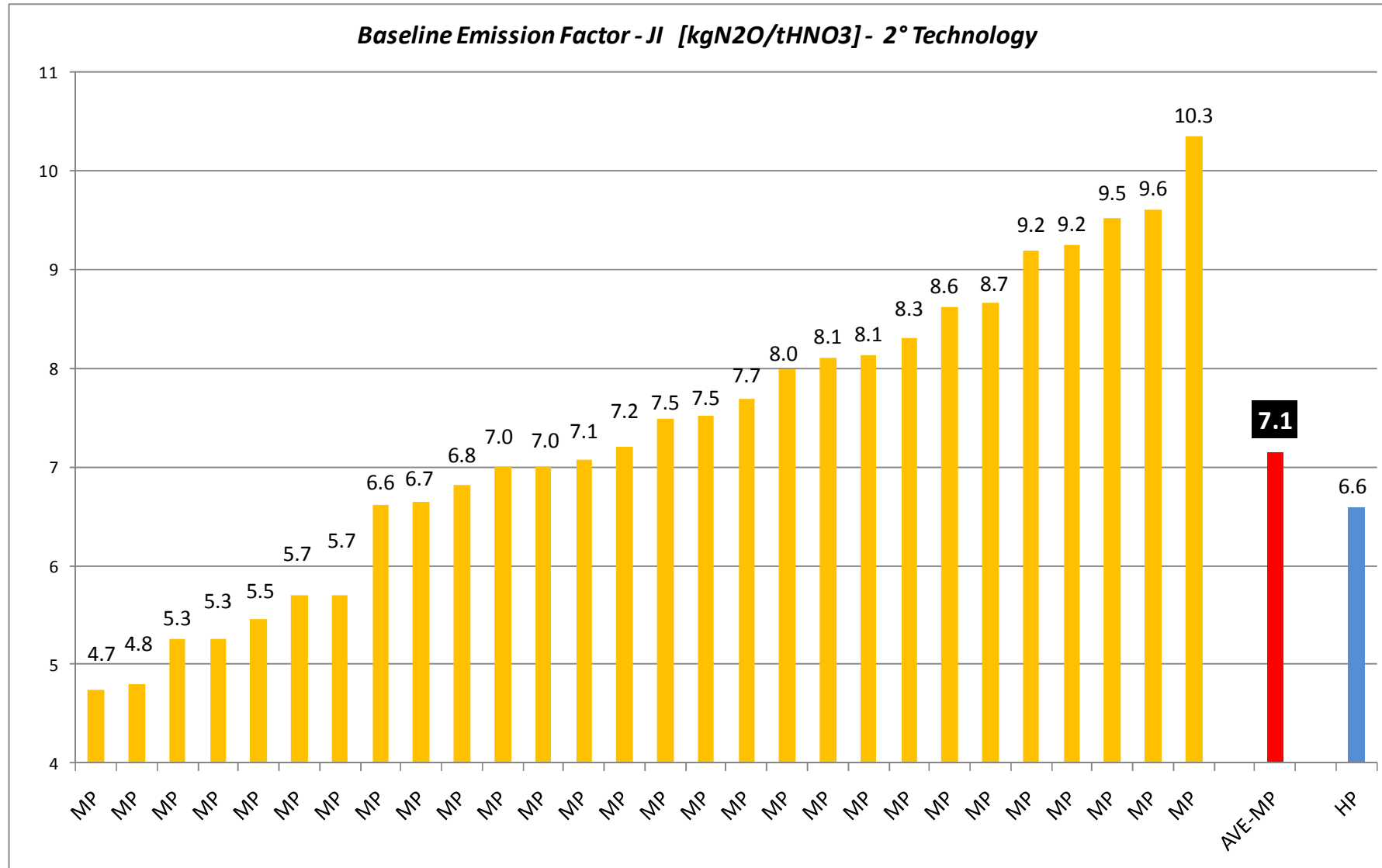
Data Source

Project overview	Plants	
		Data available
Third party validated and registered <u>CDM</u> N₂O reduction under UNFCCC		
AM0034 methodology (secondary technology)	54	28
AM0028 methodology (tertiary technology)	14	14
Third party validated <u>Jl</u> N₂O reductions		
AM0034 methodology (secondary technology)	28	18
AM0028 methodology (tertiary technology)	2	1
	98	61

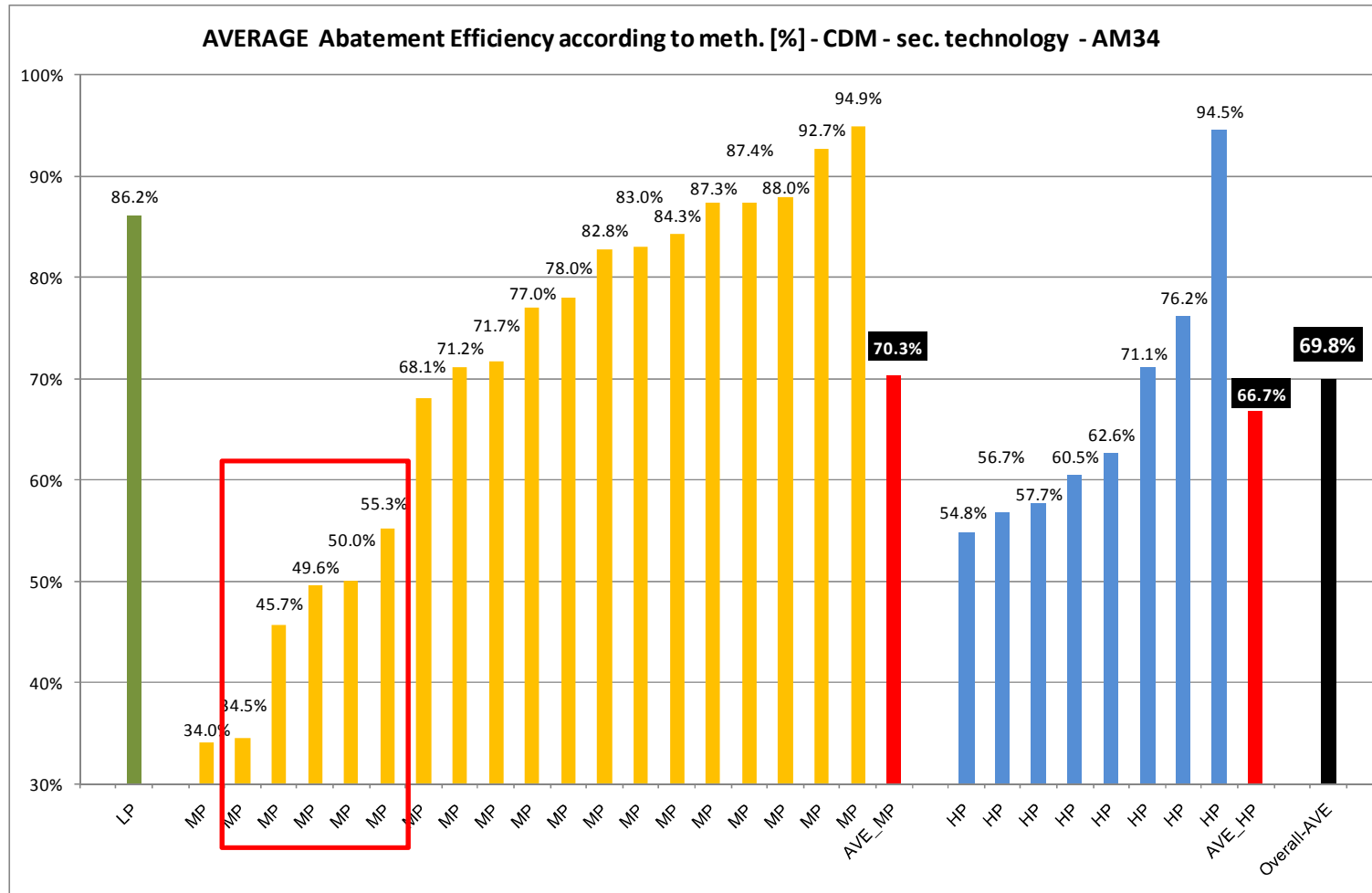
Baseline Emission Factors: Developing Countries



Baseline Emission Factors: Europe (JI)

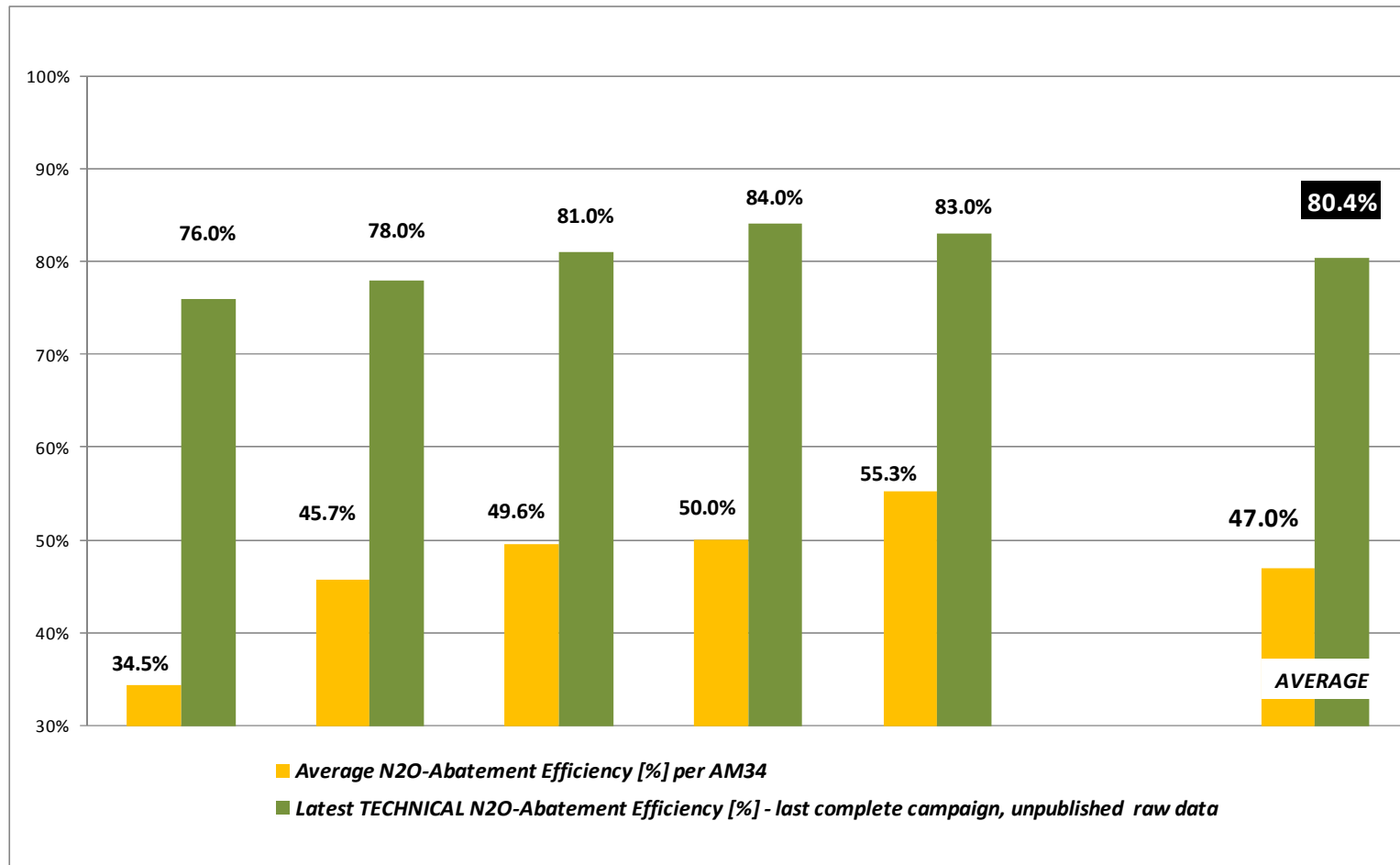


N₂O Abatement Efficiency 2° Technology (CDM)



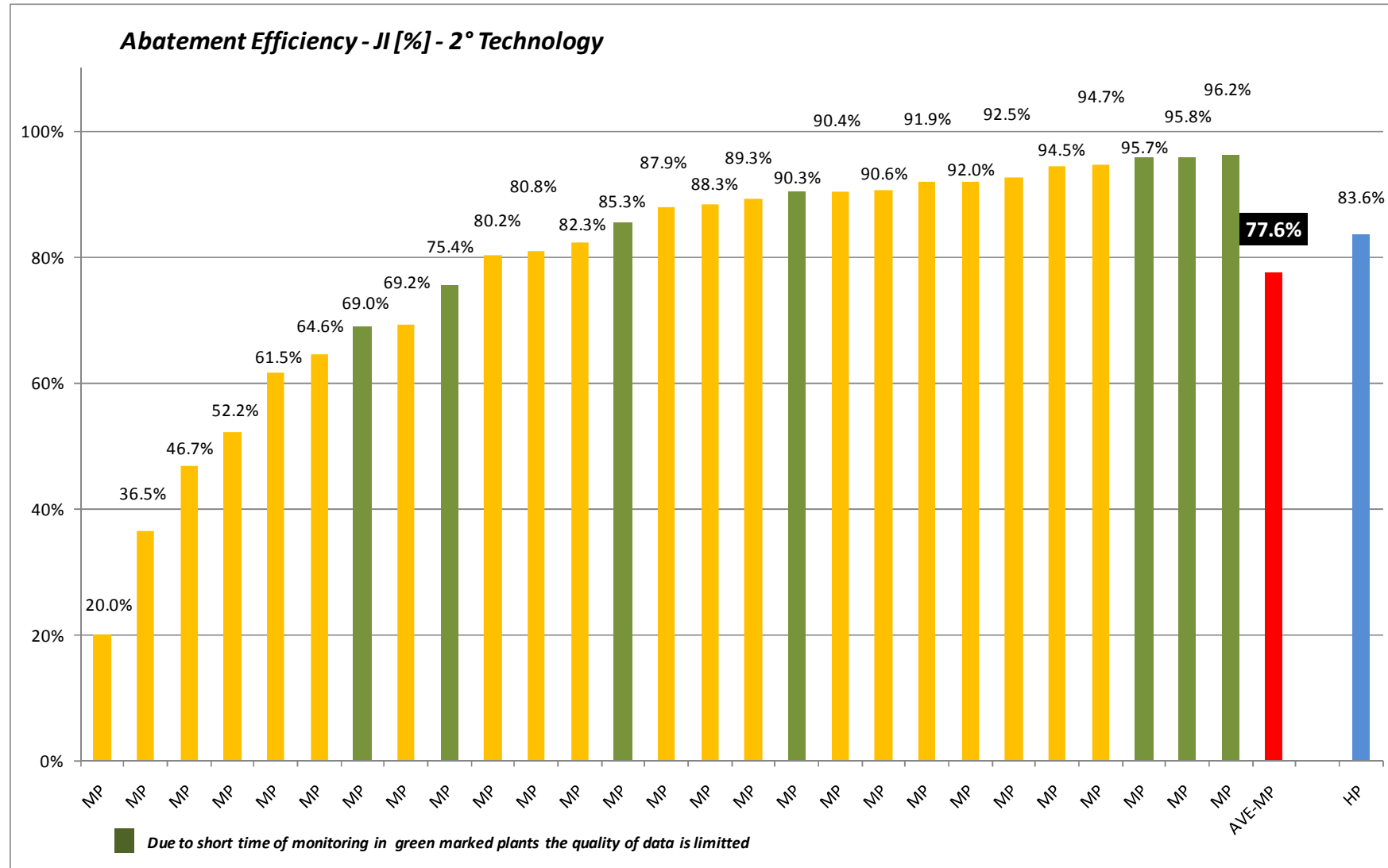
- Average values available in monitoring reports (not max. values!)
- Values derived from UNFCCC Methodologies are more conservative than measured values

High Learning Curve for 2° Technology in CDM Countries

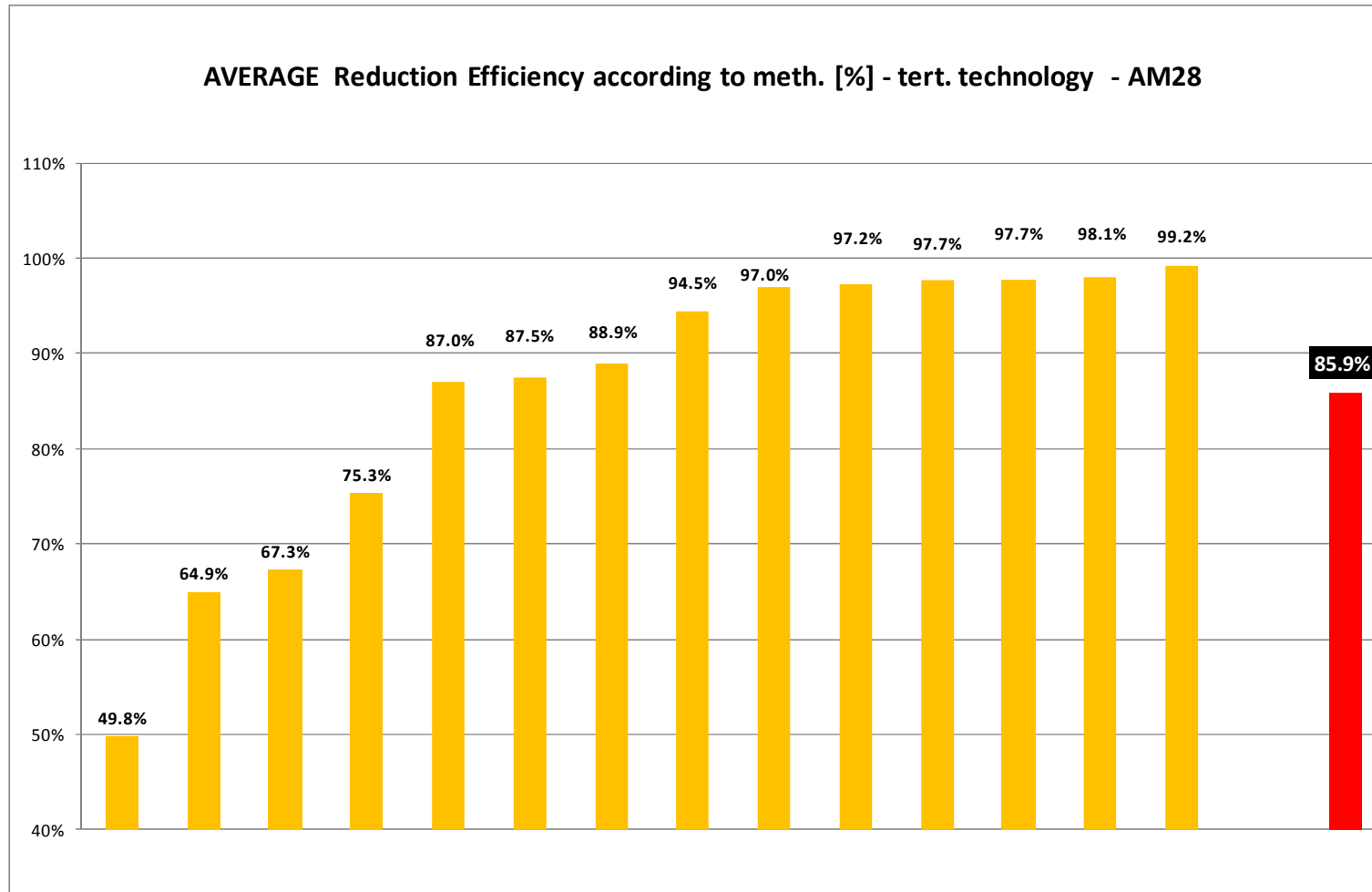


- Abatement efficiency of secondary technology has been improved over time
- Low average values are due to technical difficulties at project start

N₂O Abatement Efficiency 2° Technology (JI)

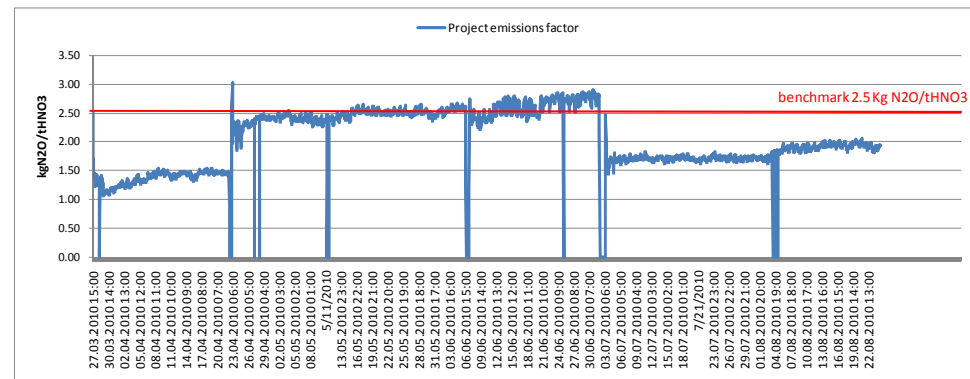


N₂O Abatement Efficiency 3^o Technology (CDM)



Why is N₂O Monitoring important?

- Results are important for an objective discussion about future benchmark setting!
- EU Member States: allocation of allowances!
- Future benchmark setting in the USA when cap & trade kicks in (e.g. 2016)
- CDM New Methodology: Inclusion of plants commercially operational after 31st Dec 2005



Conclusion: Significant Change in Approach

1. N₂O emission reductions have become a new product of the nitric acid industry
2. The global nitric acid industry will be regulated more in the near future
3. Tough product to measure: Low quality of monitoring procedures → less emission reduction credits or emission allowances → **less profit**

Contacts

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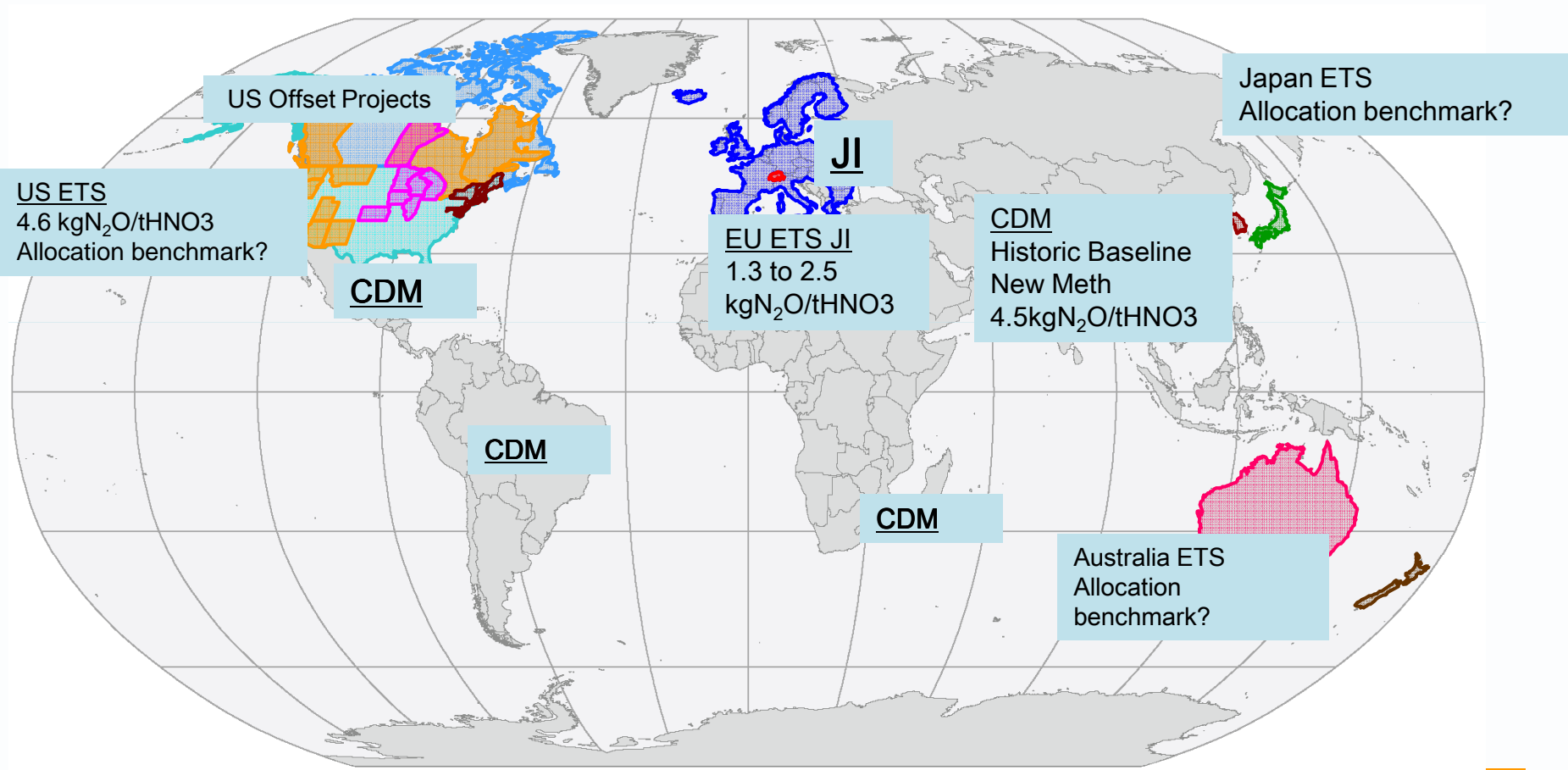
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Global N₂O Benchmark Setting



Experienced Monitoring Challenges On-Site

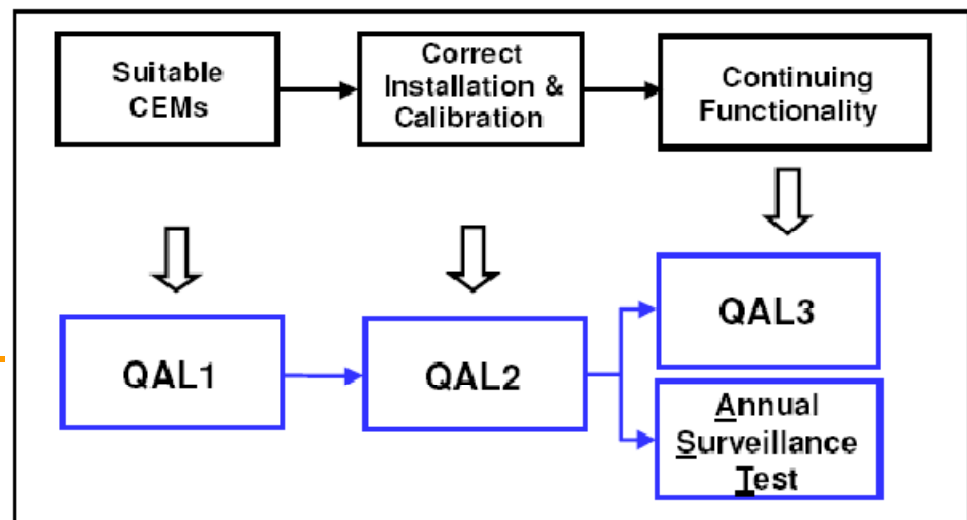
- Quality assurance of N₂O monitoring cannot be compared with NO_x monitoring
- Average time to set up the complete monitoring system: min. 3-5 months
- Detailed quality procedures need be set up from the very beginning
- Additional calibration & control procedures for nitric acid monitoring



Project Validation and Verification

- Performed by independent 3rd party Validator / Verifier
- Site Audit to verify all project information with hard evidence on site
- Principles: Accuracy, Completeness, Comparability, Consistency, Cost-Effectiveness, Reliability, Validity
- Documentation of all QA steps are key to success

If documentation does not exist or is incorrect, credits are subtracted by applying conservative values (or denied all-together)



The Transatlantic & Global Carbon Market

