Why do we need detailed data on energy consumption?

3rd EEUEEMD workshop, Paris, November 2019

Uncovering the role of digitalization for EE indicators

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Energy efficiency
Why we need detailed energy consumption data?

1. To set EE national and sectoral targets
2. To design EE policies
3. To assess the EE potential
4. To understand energy demand trends
5. To assess the impact of EE policies implementation
6. To set EE and CO2 Long term forecasting scenarii
7. To monitor the contribution of Energy efficiency in NDC's
8. To inform decision makers and the general pubic
9. Energy efficiency market insights

ADEME

Agence de l'Environnement et de la Maîtrise de l'Energie

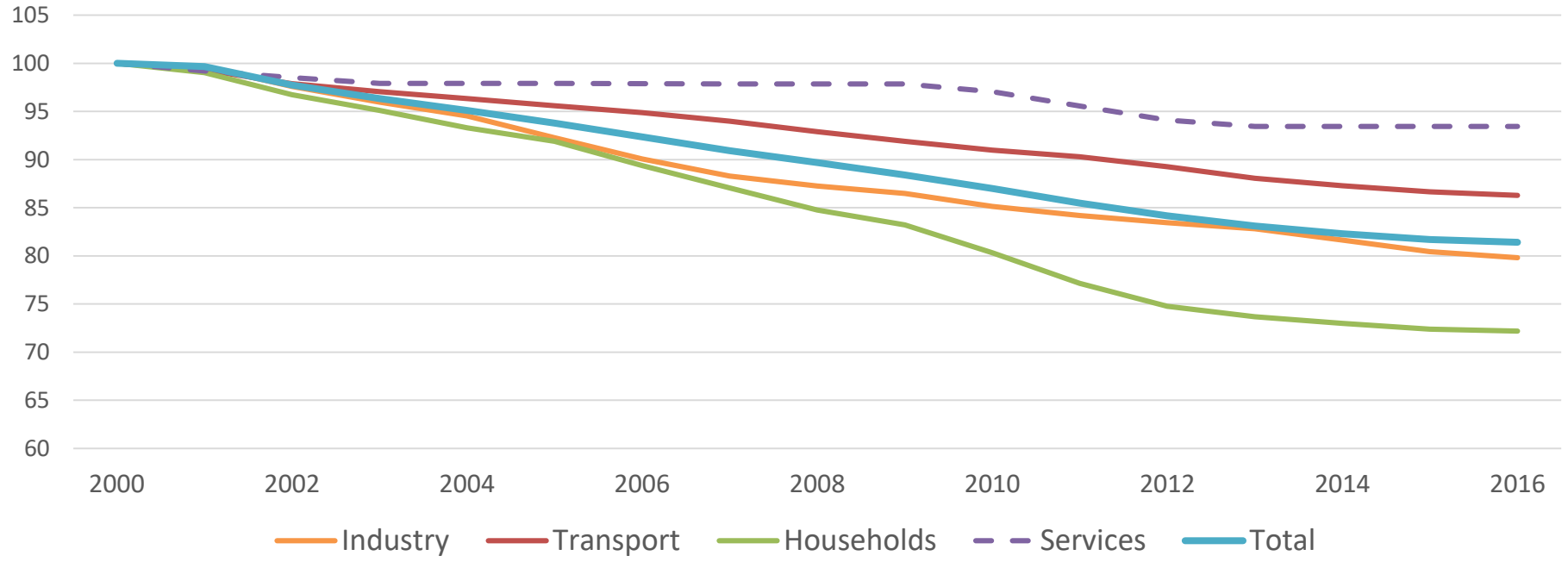
Data collection for EE monitoring requires to go beyond the energy balance?

Type	Level
1. Energy intensities	by sector & sub sector
2. Adjusted intensities	final and industry
3. Specific energy consumption	by sub sector & end-use
4. Benchmarked specific	steel, cement, paper, heating
5. Energy efficiency indices (ODEX)	final and by sector
6. Energy savings	final, by sector and sub sectors
7. Indicators of diffusion	by sector
8. CO_2 intensities	by sector & sub sector
9. Specific CO2 emissions	by sub sector & end-use
10. Fuel poverty	households
11. Sufficiency 12. Short term indicators	by sub sector & end-use

1a: To monitor target
Will EU be reaching the EE target in 2020 ?

- Energy efficiency of final consumers improved by 1.3%/year between 2000 and 2016 (1.4%/yr before 2007 and between 2010-2014). Significant slow down since 2014 (0.5%/year).

Energy efficiency trends for final consumers (EU)



ODEX=81 in 2016 ➔ 19% energy efficiency improvement or 1.3%/yr

2. EE policies are designed at level of technologies or end-uses

EE Policies	Type of informations
Thermal Building code	Consumption for space hating of new buildings
Standards for electric motors	Electricity consumption of electric motors
Banishment of incandescent lamps	Consumption of lighting in households
Subsidies for co-generation	Survey on co-generation in industry
Subsidies for electric cars	Electricity consumption for cars
Bonus-Malus for cars	Fuel consumption per car
VAT reduction for electrical appliances	Energy consumption by electric al appliances
Audits in schools & hospitals	Consumption of services by sectors
Label for electrical appliances	Electricity consumption per appliances
Voluntary agreement in industry	Consumption of industry by branch
Obligation to utilities	All sectors at detailed levels

2a: Detailed Energy data and policy evaluation

2015 evaluation of the Danish EEO scheme

Econometric analyses using long time series of main drivers affecting energy consumption, and costs of the scheme, to assess the overall net effects / additionality of the scheme

Results conclusive only for industry. Data available in other sectors not disaggregated enough to enable to distinguish the effects of the scheme from effects of other factors (e.g., energy prices).

EPATEE

→ Need for disaggregated data for both, energy consumption and energy efficiency actions/schemes

For more details, see thec ase study on the Danish EEO scheme

2ca: Detailed Energy data and policy evaluation

ADEME's data road map for household renovation

The impact of regulation on publishing public data

- **EPO Data base**: Gathers all details information issued by the implementation of the Energy performance Obligation scheme of the EU EPBD directive. This survey supposes to manage several millions of data. Usefull for EE potential assessment.
- **TREMI** : Survey on energy efficiency refurbishment works for individual homes : (30 000 households interviews by internet which reduces the cost of data collection.
- **DATABAT** : Call of tender to develop **open data platform** on household data including consumption
- **SIMUL AIDs** : Database on financial aids for Energy refurbishment useful for energy info centers, local agencies, general public, NGOs etc.)
- **Dialogie; Annuaire RGE; FeeBAT; PNB; OPERAT etc.)**

Do we need a data scientisy at ADEME?

(2b) Detailed Energy data and policy evaluation

NEED National Energy Efficiency Data-framework

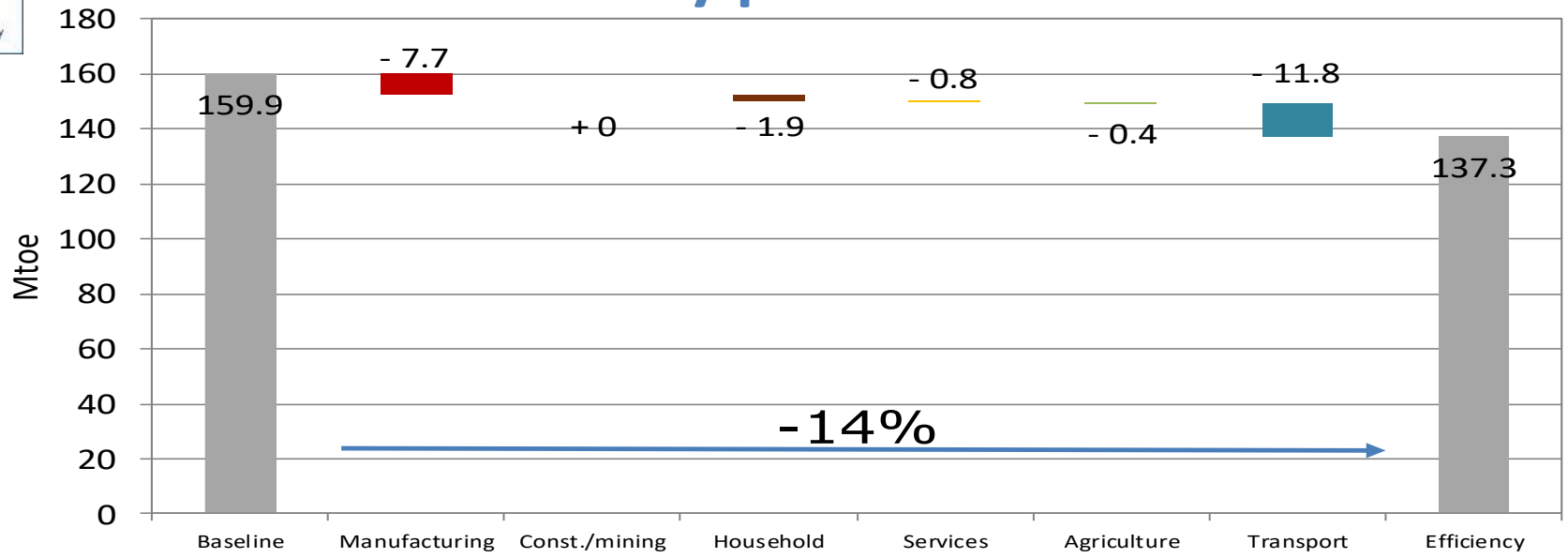
NEED combines different data sources enabling to match data on energy consumption, properties, households and energy efficiency actions registered from monitoring of EE policies

Importance of interfacing the databases.
Enabling evaluation of energy savings per type of action and at policy (or policy mix) level.
Data can be used by the ministry and by academics → a wealth of analysis, useful for policy making, for stakeholders and for informing the public.

For more details, see the BEIS presentations at the previous G20-IEA workshop of Dec.2016, and at the 3rd EPATEE workshop in Nov.2018

3a: Long term impact assessment of the energy efficiency potential: Mexico

2030



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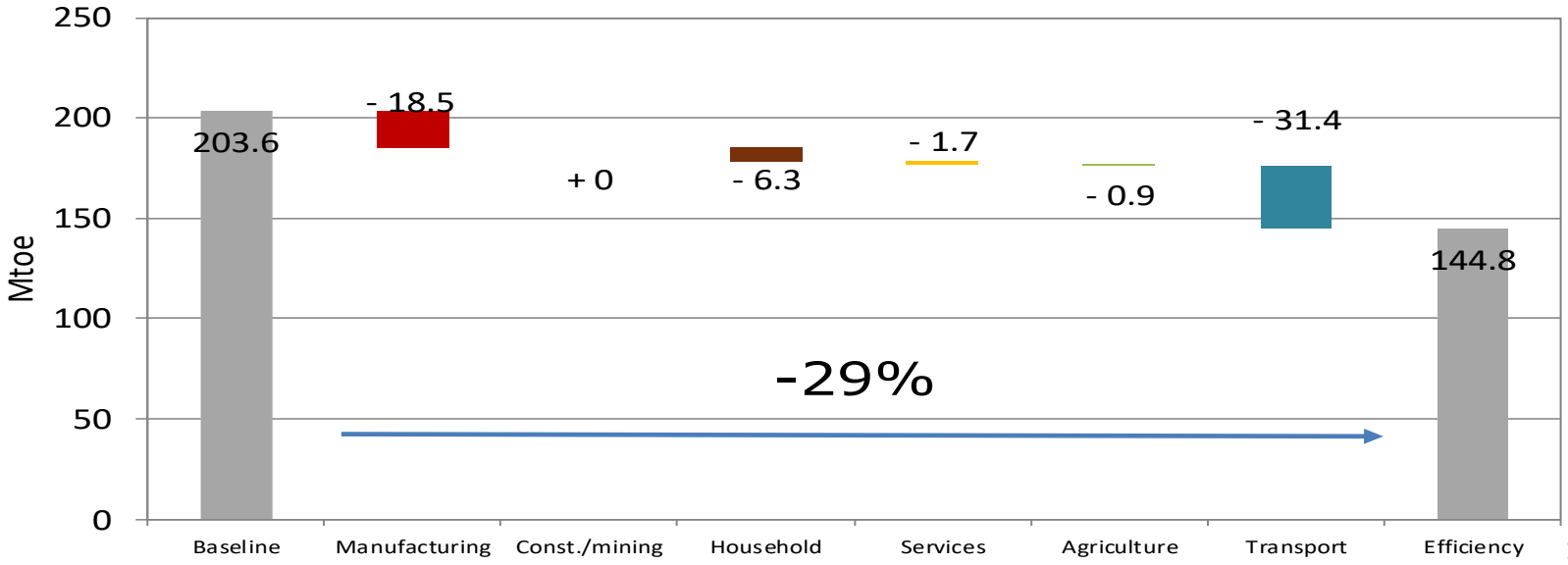
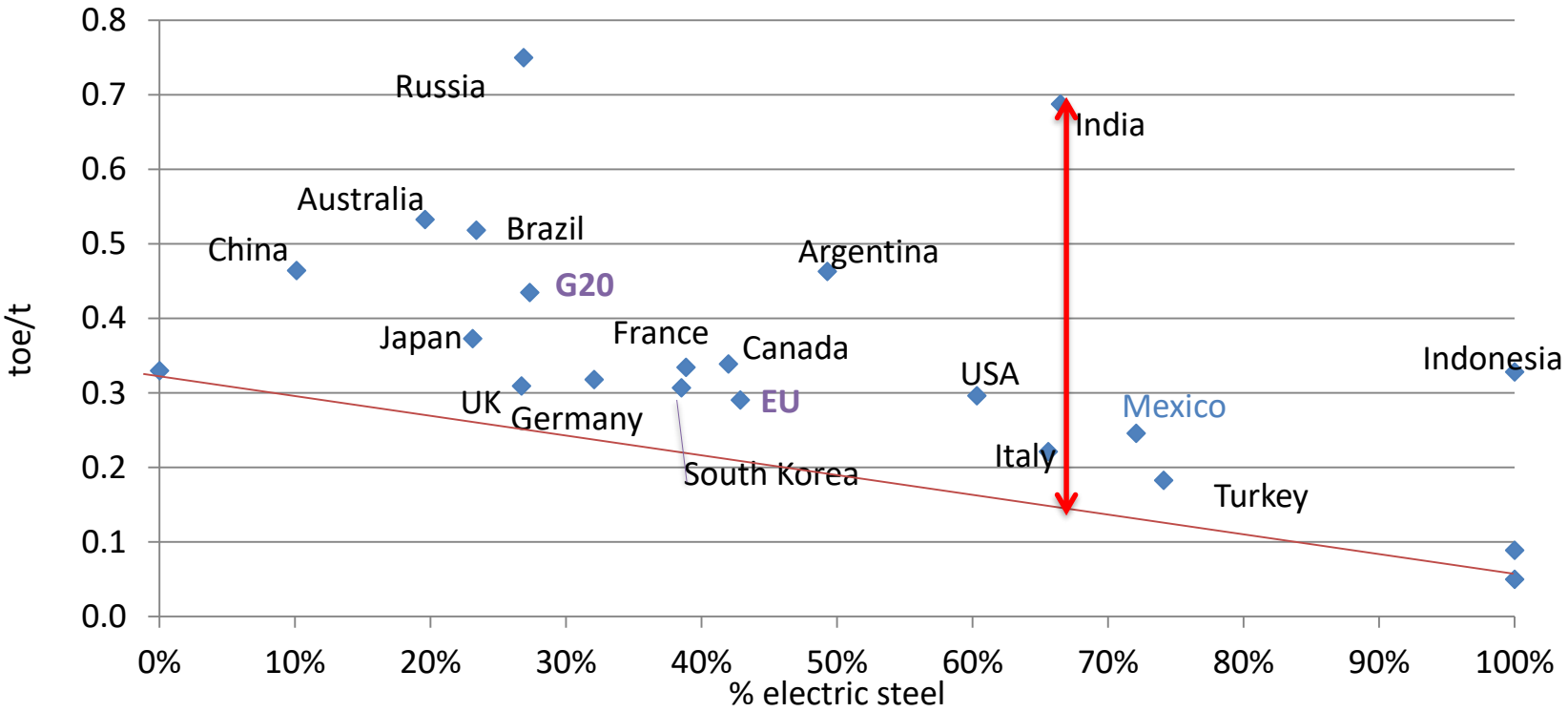


3b. To assess E.E. potential assessement based on international benchmarking

Comparison of specific consumption for steel should be made at similar process mix as non electric steel is roughly 3 times more energy intensive than the non electric process.

Average energy consumption per ton of steel (2015)



orange line: world best practice

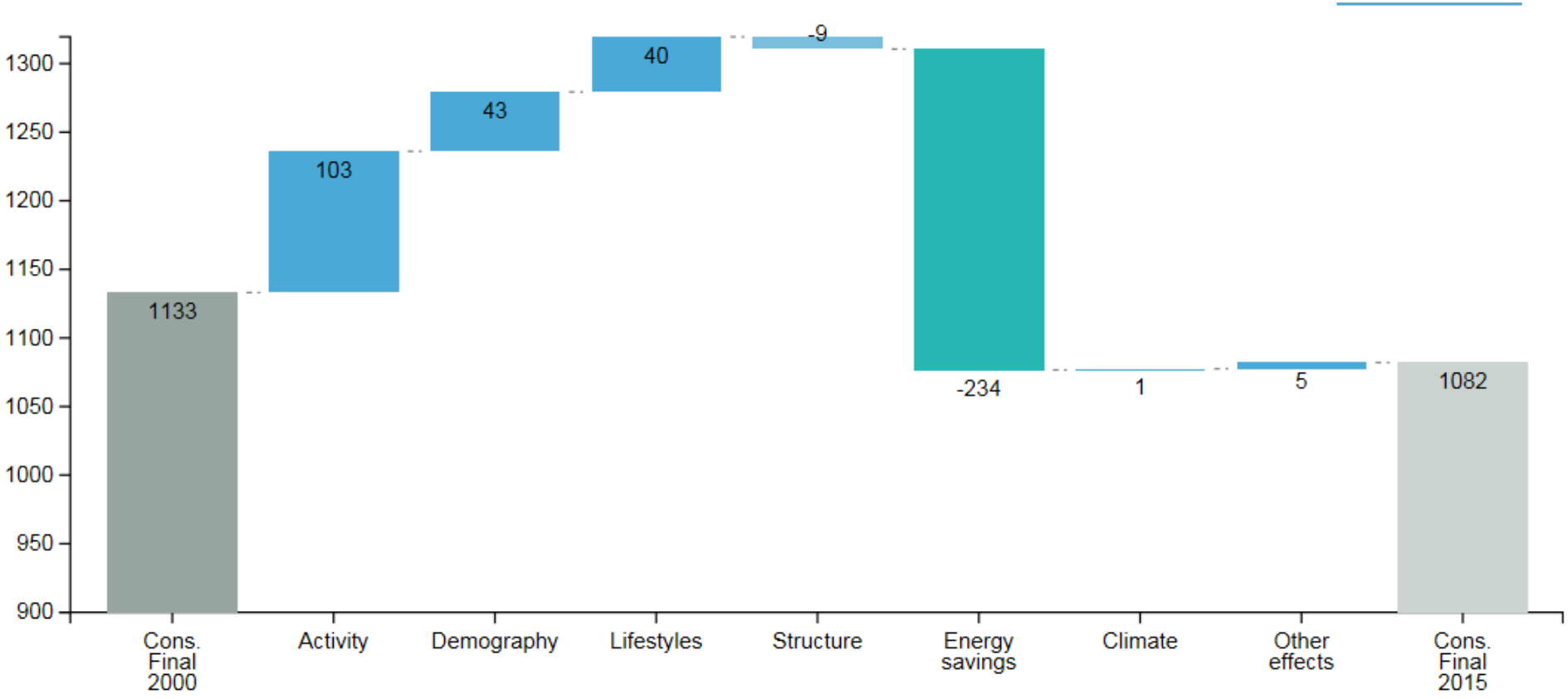
Source: WEC

4a : To understand the energy demand trends
Decomposition of total final consumption

The final energy consumption decreased by 51 Mtoe between 2000 and 2015 in the EU.

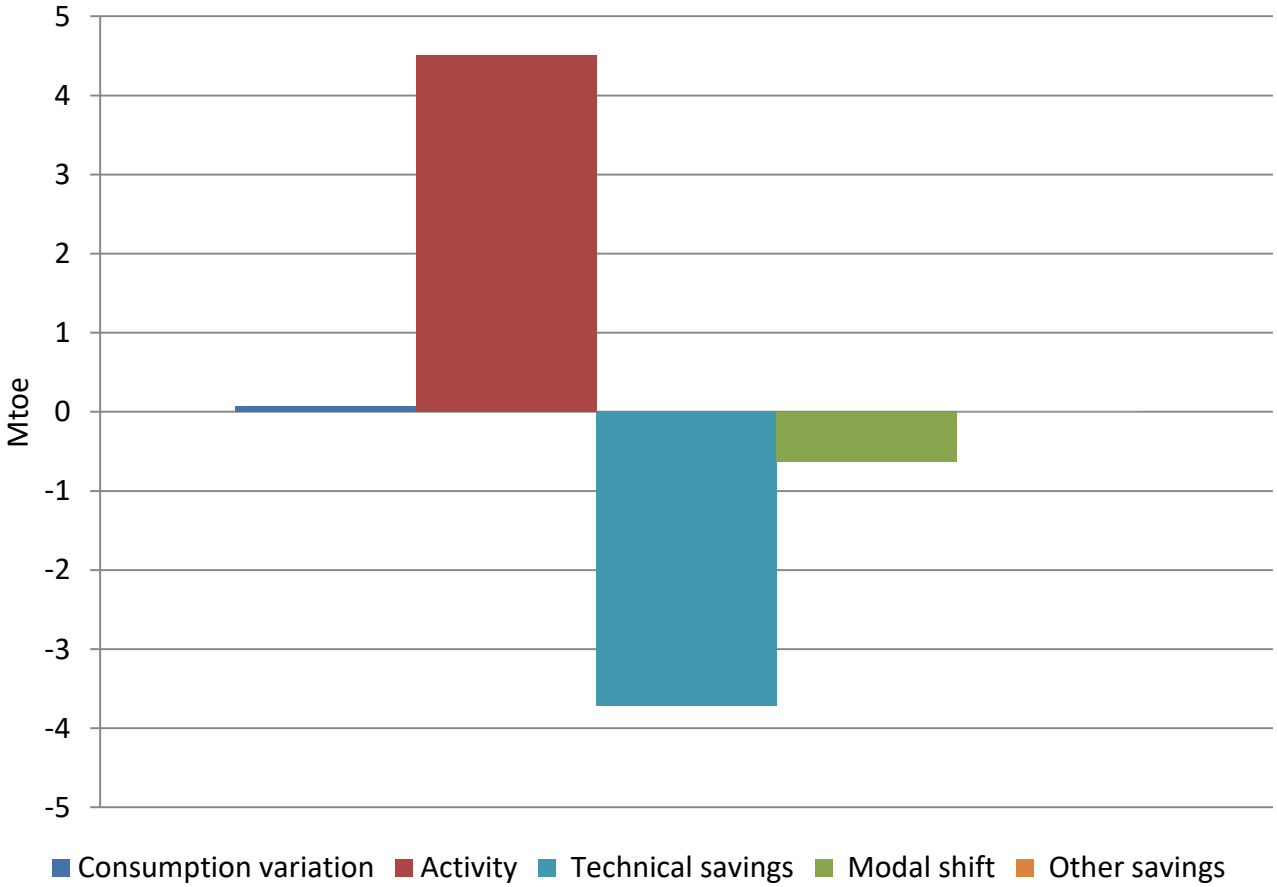
- In EU, increase in activity contributed to raise consumption by 103 Mtoe, lifestyles and demography by around 40 Mtoe each.
- Technical energy savings decreased the consumption by 234 Mtoe in the EU.

Drivers of final energy consumption variation (Mtoe, EU 2000-2015)



4b. To understand energy demand trends

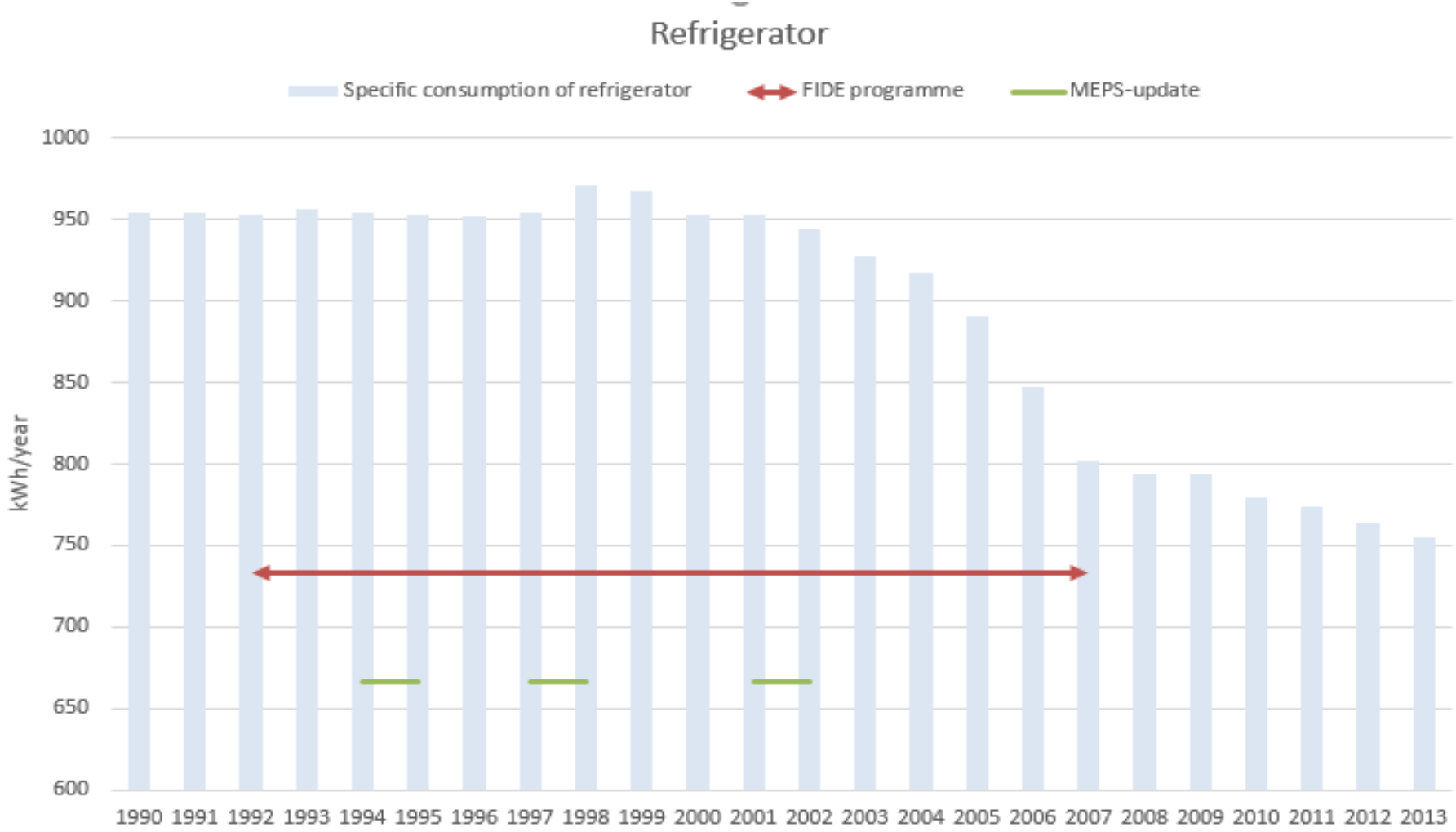
Factors of the energy consumption variation in transport: Mexico (2010-2014)



Energy consumption in transport was almost at the same level in 2014 as in 2010: energy savings (-3.7 Mtoe) and to a lower extent modal shift to less energy intensive modes of transport (-0,6 Mtoe) balanced the effect of the growth in traffic in passengers or goods (4.5 Mtoe) .

Source: CONUEE, ADEME, AFD project

5a: To assess the impact of policies
Monitoring the NEEAP through indicators: Mexico



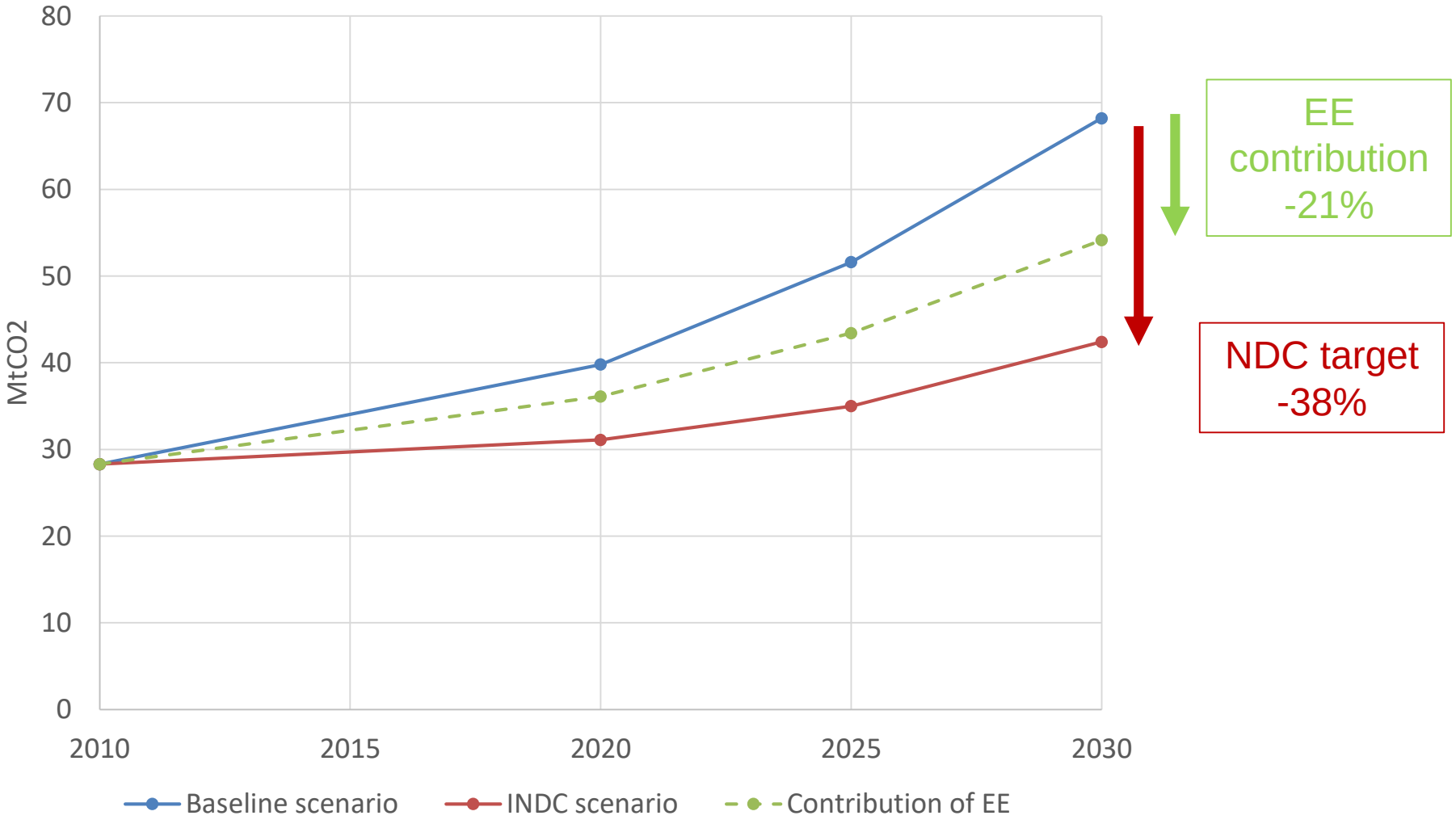
6: To elaborate Long term EE vision

The technico-economic model Medpro requires around 1500 times series

- Impact of Energy efficiency on:
  - GDP
  - Job assessment
  - Trade balance
  - Public deficit Carbon and energy efficiency prices
  - Energy bill
  - Households expenditures

7. To assess the contribution of EE in NDC's

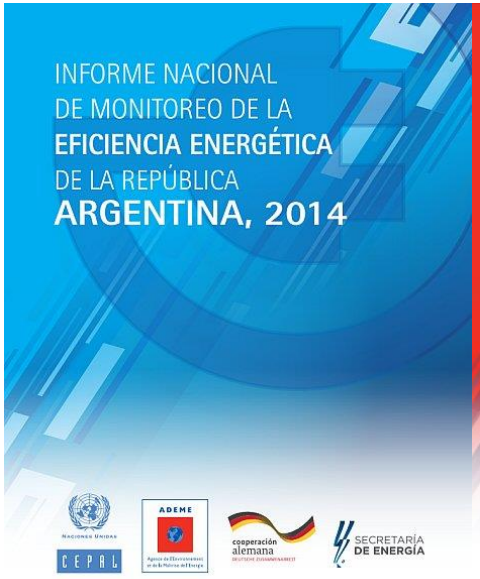
Case of Tunisia

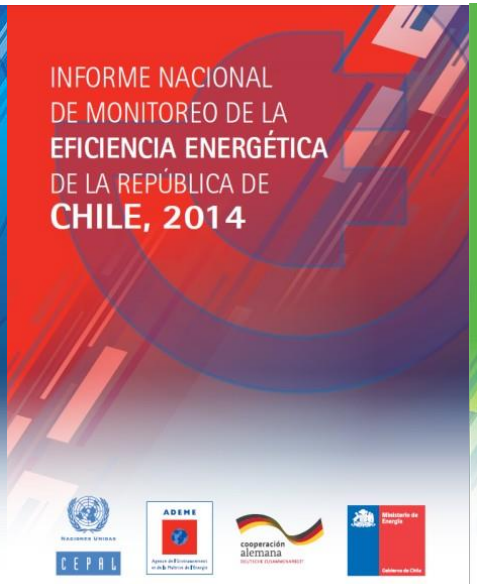


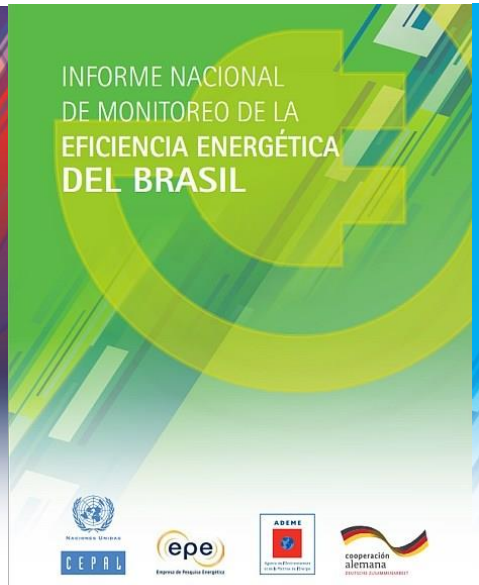
Source: based on an on going UNDP study (draft)

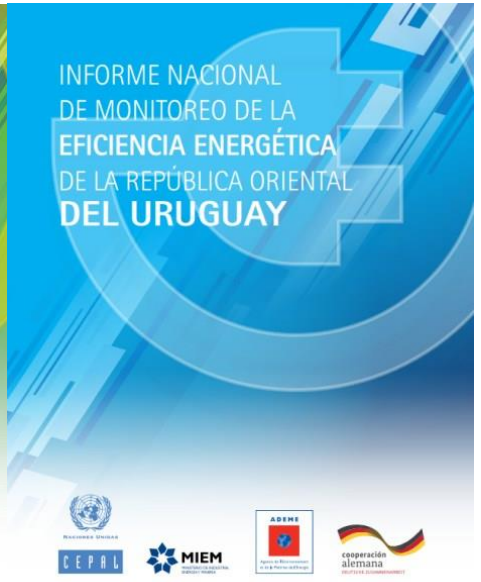
8a : To inform the general public
The Interactive internet national BIEE data base

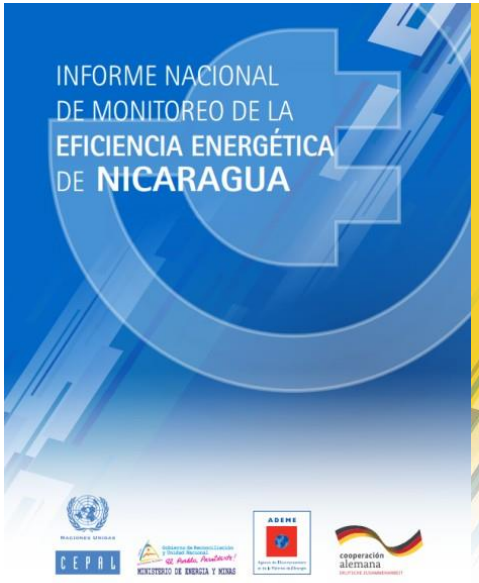
8b. To inform the stakeholders
BIEE national reports

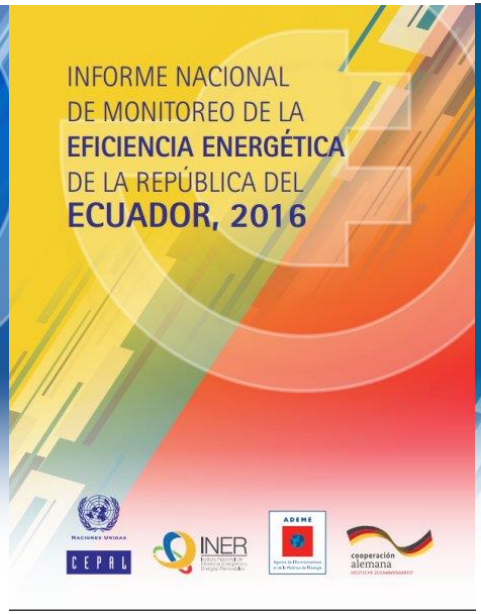


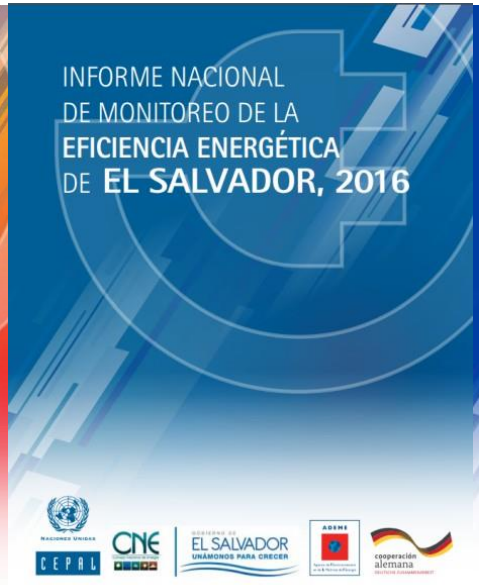


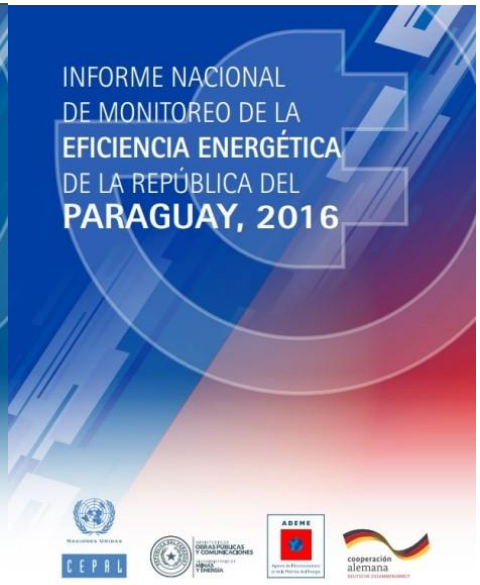








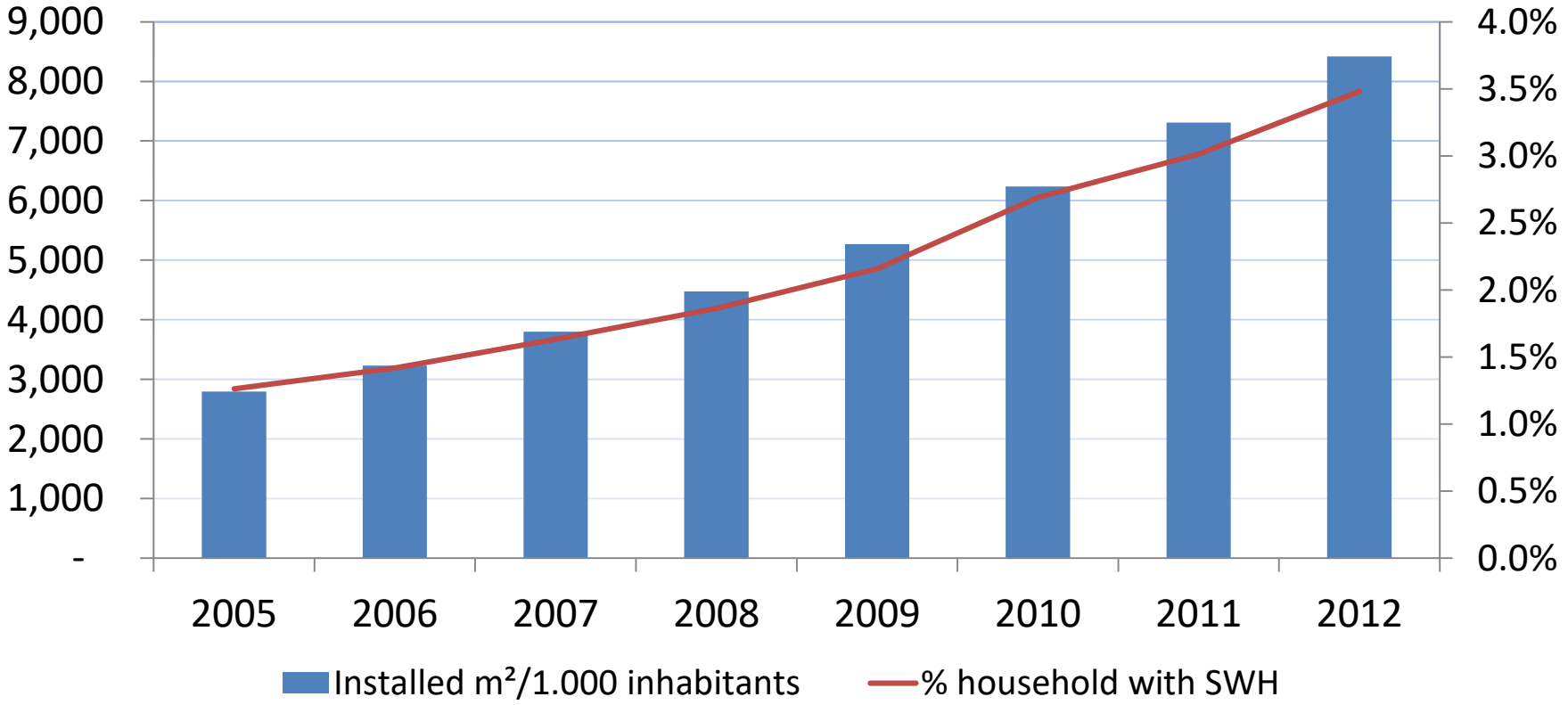




9. Energy efficiency markets insights

Knowledge of energy and energy efficiency equipments market are useful for utilities, ministries, equipment manufacturers, analysts…

Penetration of solar water heaters: Brazil



Source: EPE from Brazilian Association on Refrigeration, Air Conditioning, Ventilation and Heating (ABRAVA)

Conclusion : Energy data and policy evaluation

Challenges:

- Early planning of data collection not so easy
- To justify the resources (time and budget) needed to collect data
- Maintaining consistent series over time, while policies change
- Importance of quality check
- Online platform can help, but upfront investment needed
- Conditions to access and use data (privacy issues, GDPR in EU)
- Technical issues to match and handle large amounts of data
- More difficulties to find data about costs
- Need to improve the documentation of data
- Impact of digitalization and open data

Good practices

- Showing the added value of the data collected: feedback loop about what the data are used for
- Complementarity of regular monitoring and in-depth targeted studies