

Energy efficiency policies implementation

A world wide perspective

The WEC energy efficiency 2012-13 survey

SE Asia region Roundtable on energy efficiency policy
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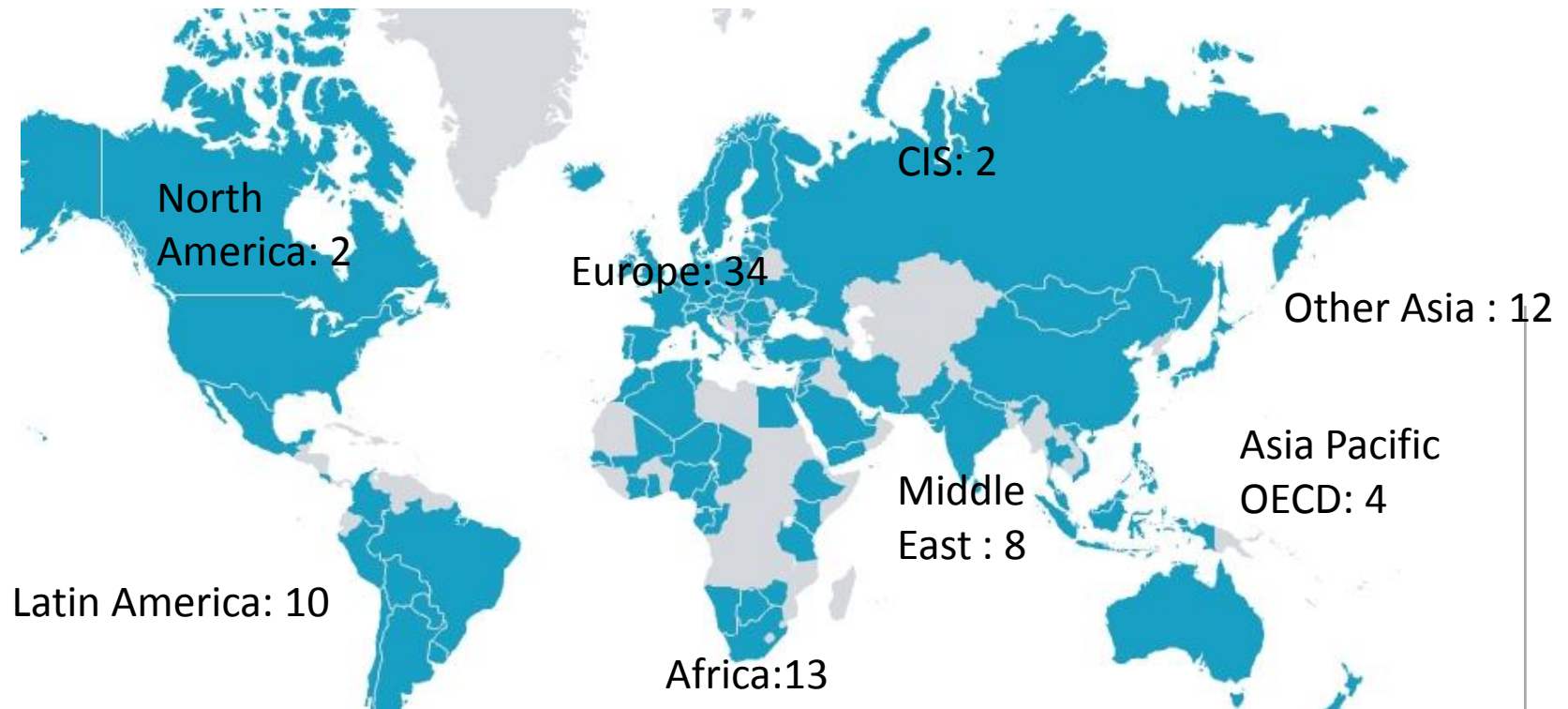
1. Introduction

- 2. Overview of energy efficiency measures
- 3. Energy efficiency measures by sector
- 4. Conclusion and recommendations

WEC ADEME survey overview

- A survey on policies and measures has been carried out with national WEC member committees and other organisations in 2012-13; updates the previous survey of 2009
- This survey covered :
 - The existing institutions (energy agencies) and energy efficiency programmes and targets.
 - The energy efficiency measures by type: financial, fiscal, regulation and voluntary agreement
- In total 85 countries are covered
- All the survey results have been included in an on line data base available at http://www.wec-policies.enerdata.eu/wec_policies-test/#BC-services

Countries covered by 2012-13 survey: 85 countries*



Measures covered in the survey

■ Regulations:

- Minimum Efficiency Performance Standards (MEPS) and labels for electrical appliances and cars, buildings;
- Other regulatory instruments: Mandatory energy audits, mandatory energy managers, mandatory energy saving plans, energy saving quotas;
- Mandatory training for professionals,
- Energy saving obligations.

■ Financial measures:

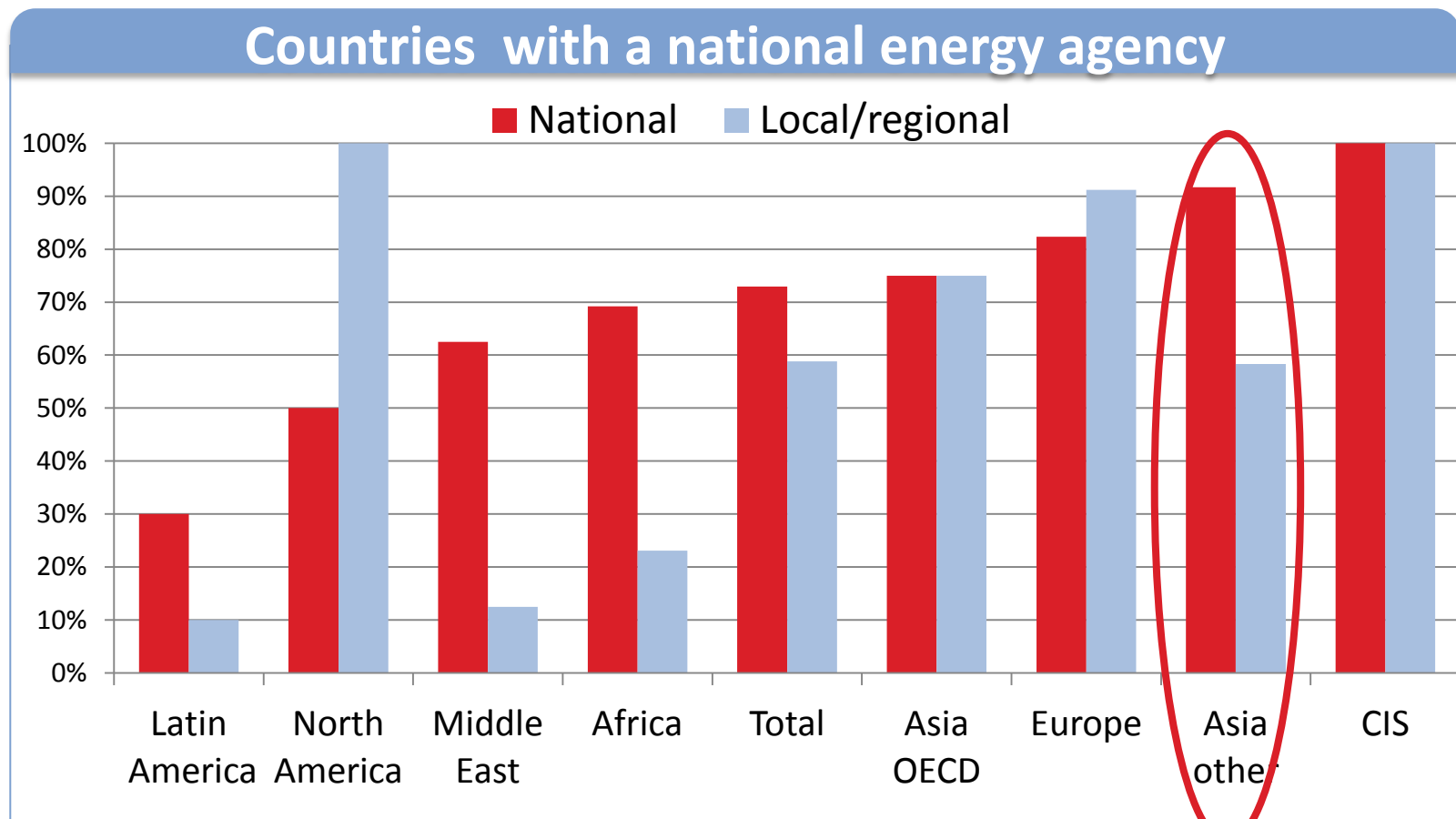
- Subsidies for audits by sector
- Subsidies or soft loans (i.e. with subsidised interest rates) for energy efficiency investment and equipment by sector and type of equipment

■ Fiscal measures:

- Tax credit for efficient equipment, and tax on inefficient appliances
- Accelerate depreciation by sector,
- Tax reduction for efficiency investment by type of tax and equipment

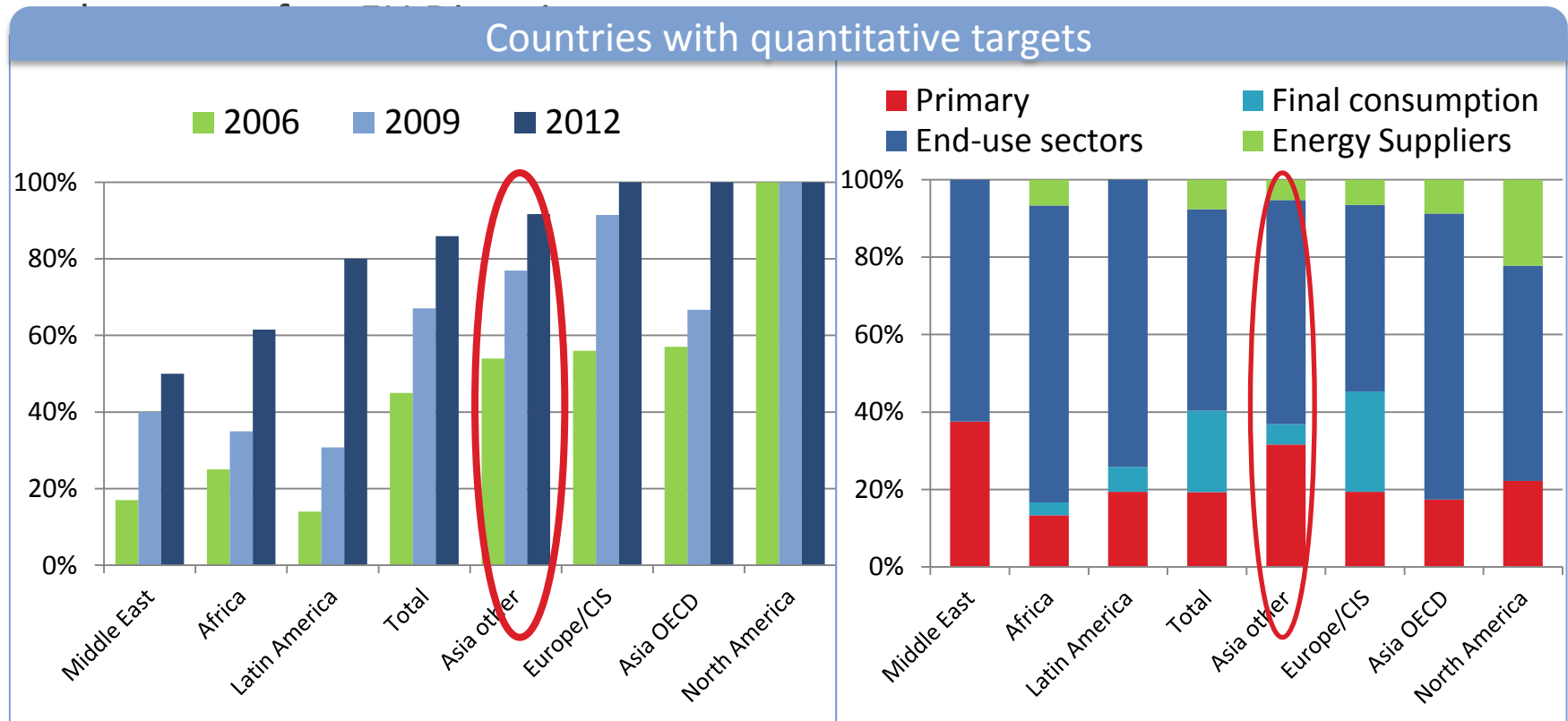
1. Introduction
- ▶ **2. Overview of energy efficiency targets & measures**
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As a whole, 73% of surveyed countries (i.e. 62 countries) have a national energy agencies ; around half of surveyed countries have local or regional agencies. Agency recently created: China, Indonesia, Senegal and Ukraine



Increasing number of countries with quantitative targets

- Progression in all regions → more ambitious policies
- 60% have end-use sector targets, around 20% have targets on primary consumption.
- Different focus according to regions: in Asia target on final consumption



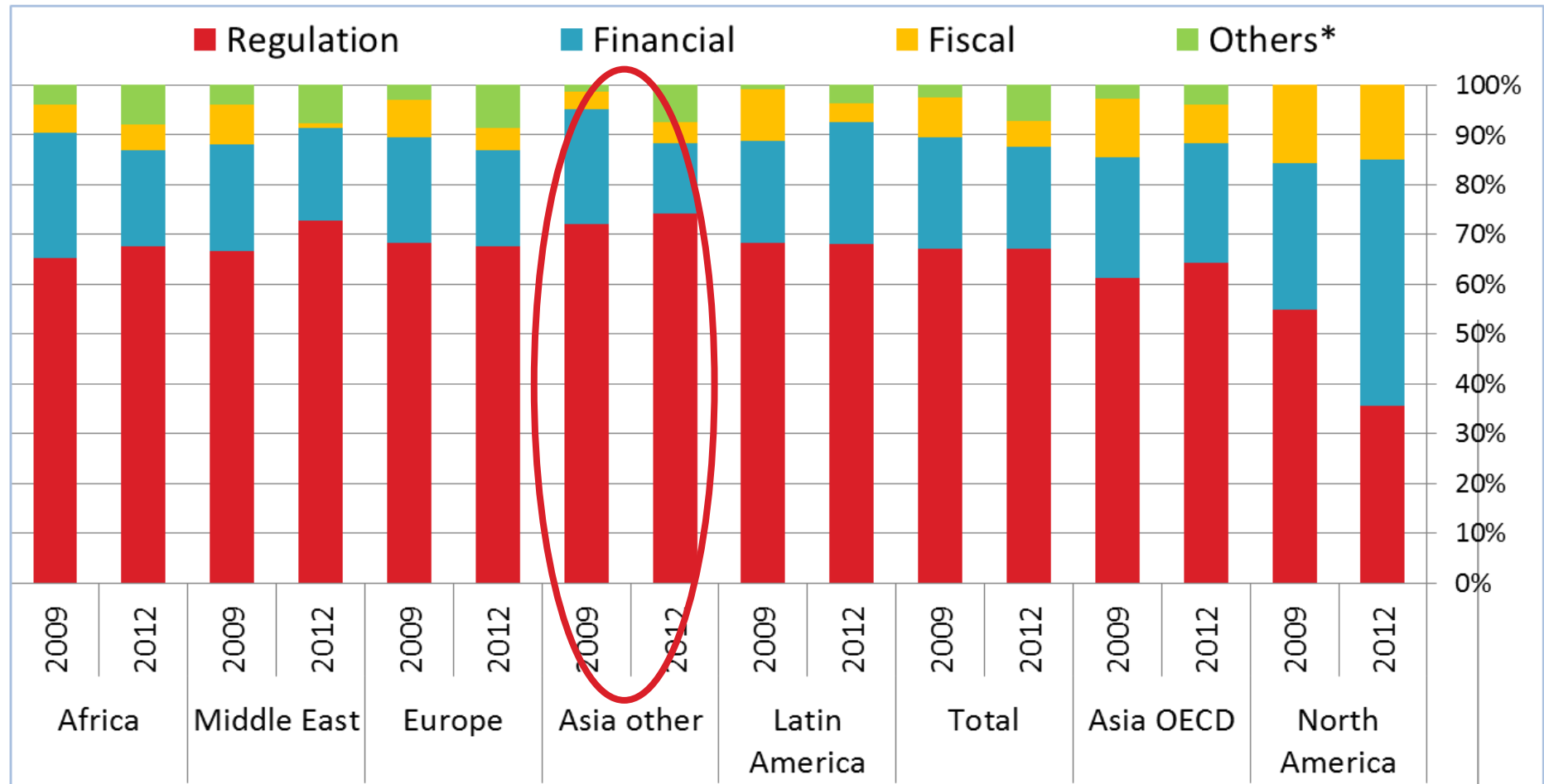
2006: 1st WEC survey

2009: 2nd WEC survey

Source: WEC survey 2012

Predominance and increasing share of regulations in the energy efficiency policy mix

Distribution of measures by type

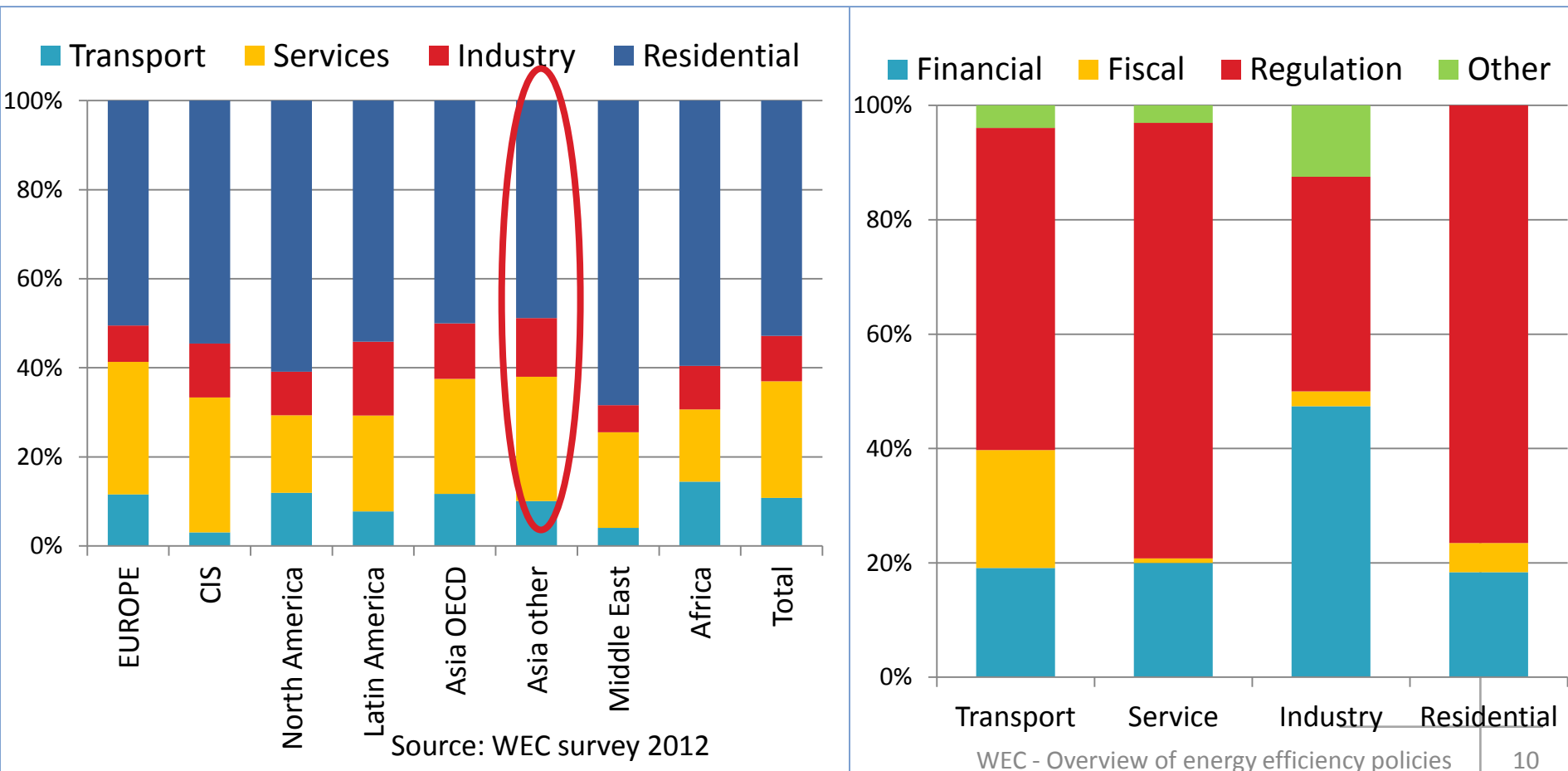


Others corresponds to Voluntary agreements, ESCO's and et certifications

Measures on residential sector are dominant in all regions (60%); Regulation are important in services and residential sectors ;

Financial incentives are more important in industry (e.g. grants for energy audits)

Distribution of measures by sector, by type and region



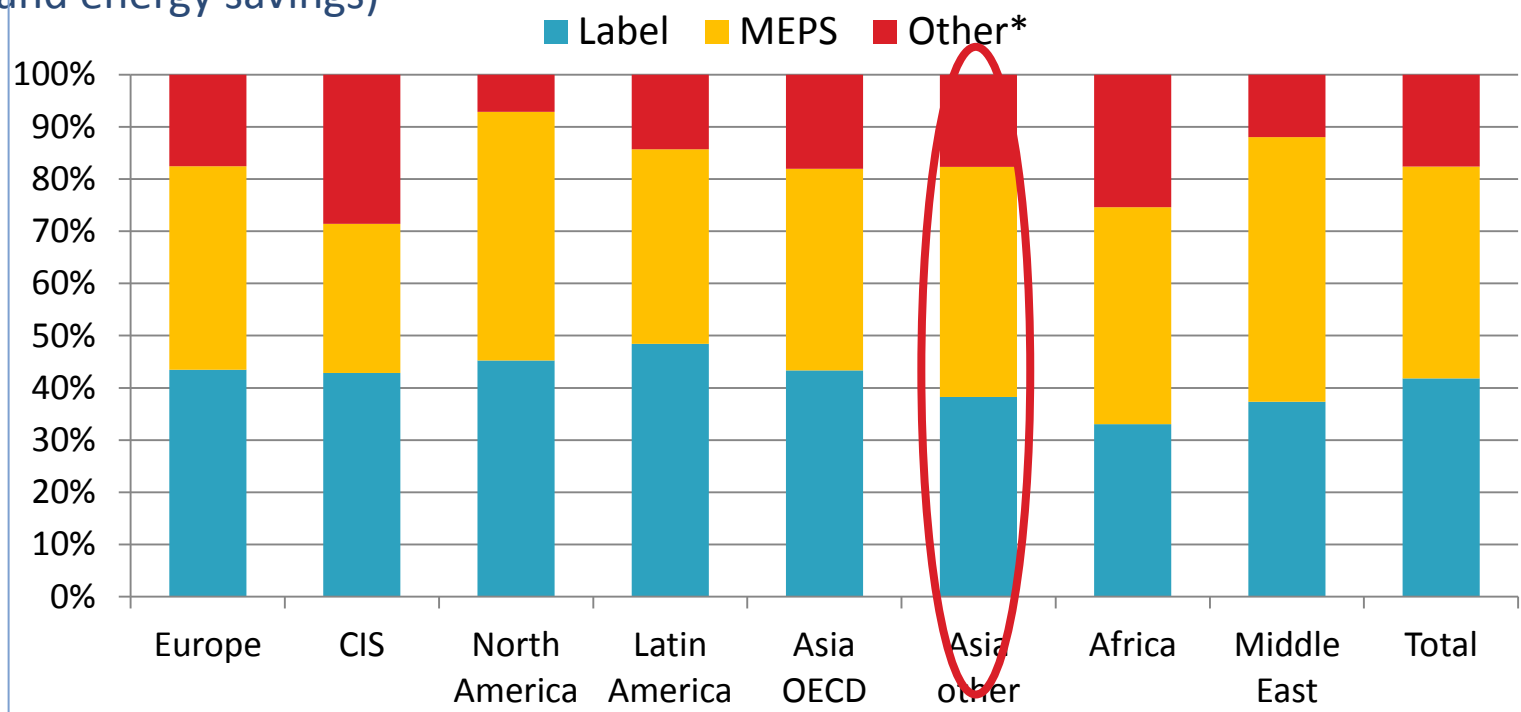
*Others correspond to voluntary agreements, ESCO and certification

Labeling is the dominant regulation (55% on average) excepted in Asia and Africa.

Minimum energy performance standards are also important with around 40% of total regulatory measures.

Other regulations (~ 5%) correspond mainly to mandatory requirements for large

Distribution of regulation by type and world region and energy savings)

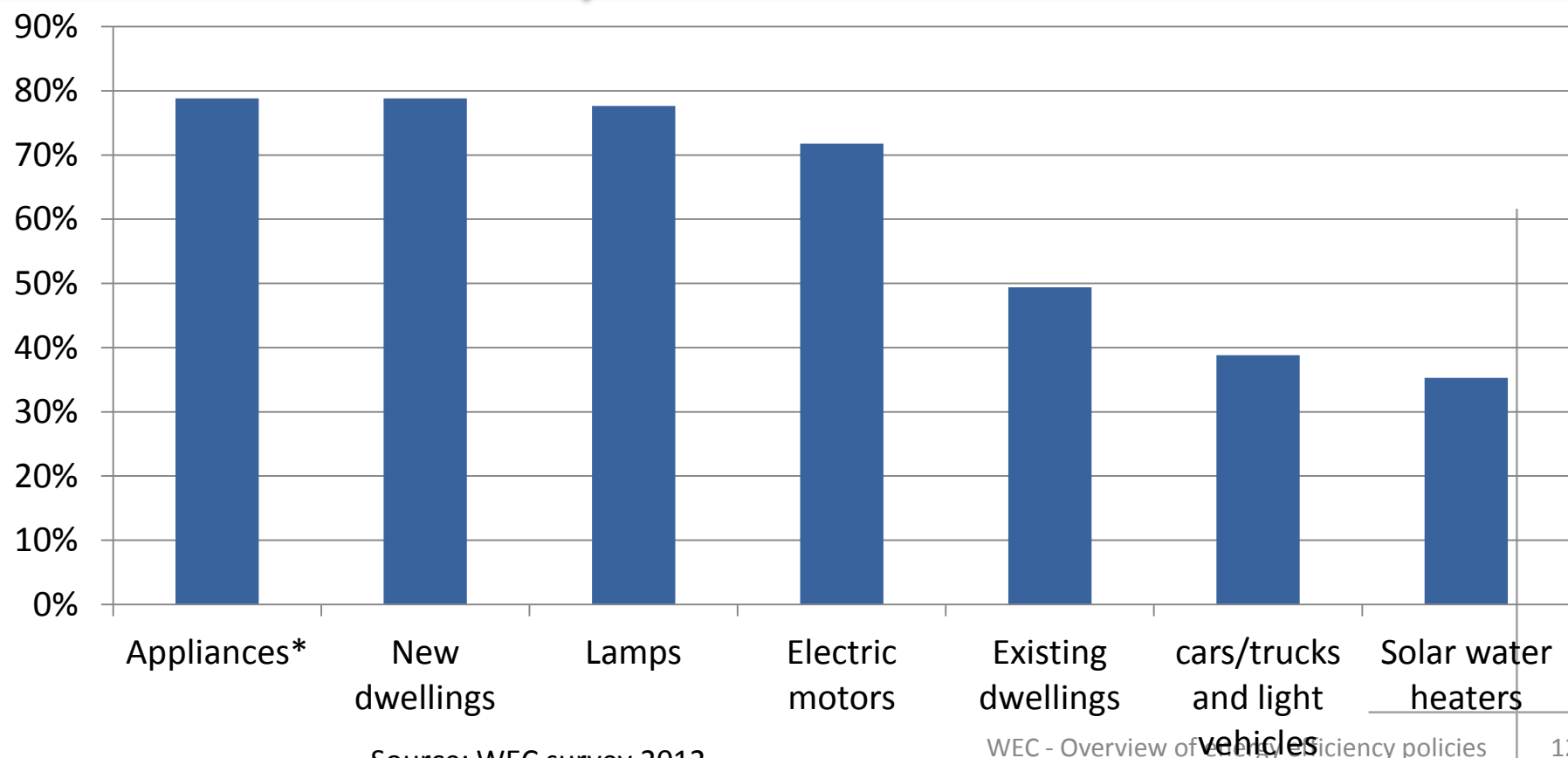


*Other: mandatory energy audits, mandatory energy managers, mandatory energy consumption reporting; mandatory energy savings plans, mandatory energy training, and incandescent lamp phase-out

~90% of surveyed countries have implemented at least one MEPS.

Norms on lamps, appliances (refrigerators, washing machines and AC) and new constructions are implemented in 80% of surveyed countries. Norms on vehicles and solar water heaters are less common.

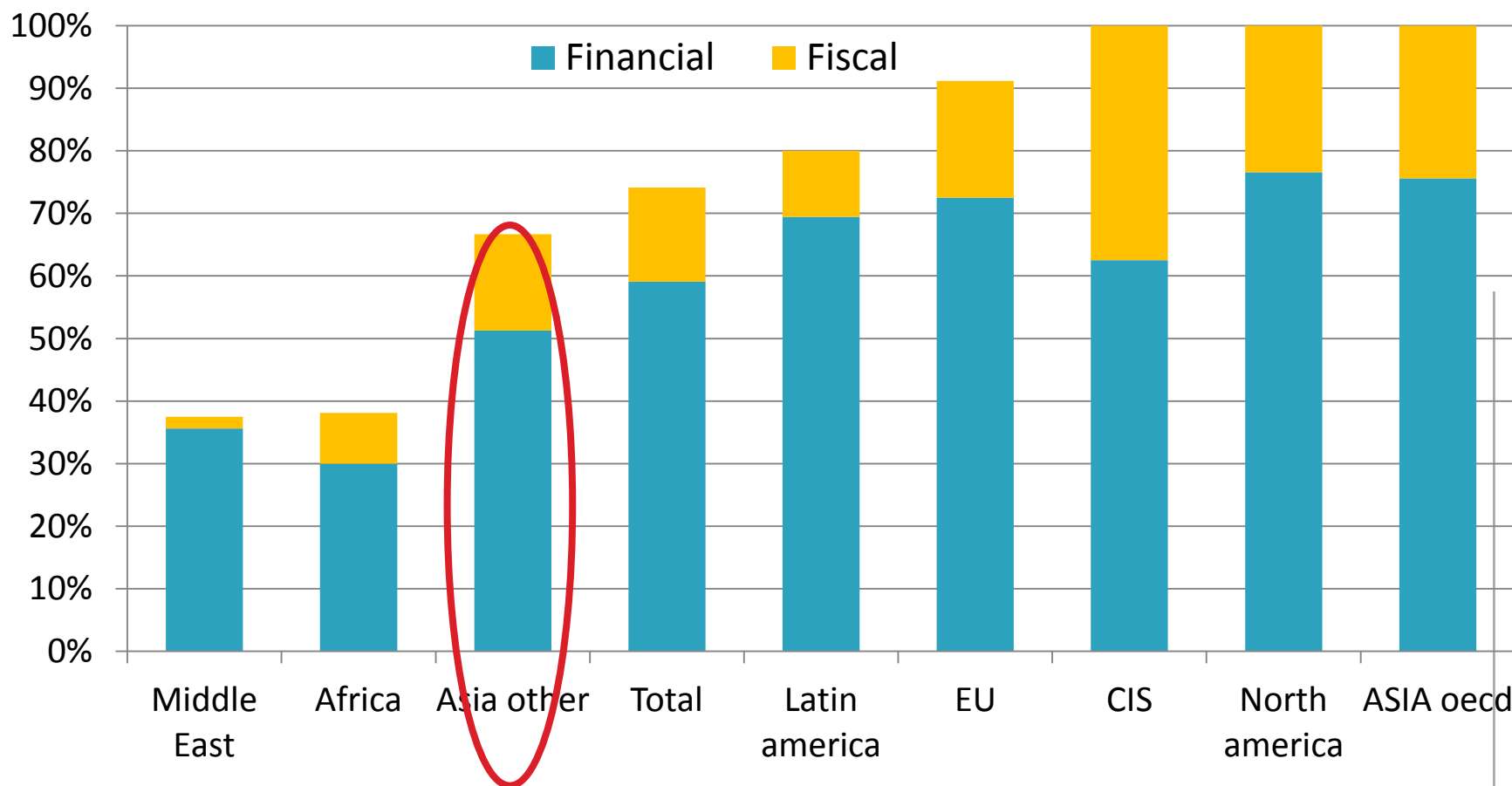
Surveyed countries with MEPS



Source: WEC survey 2012

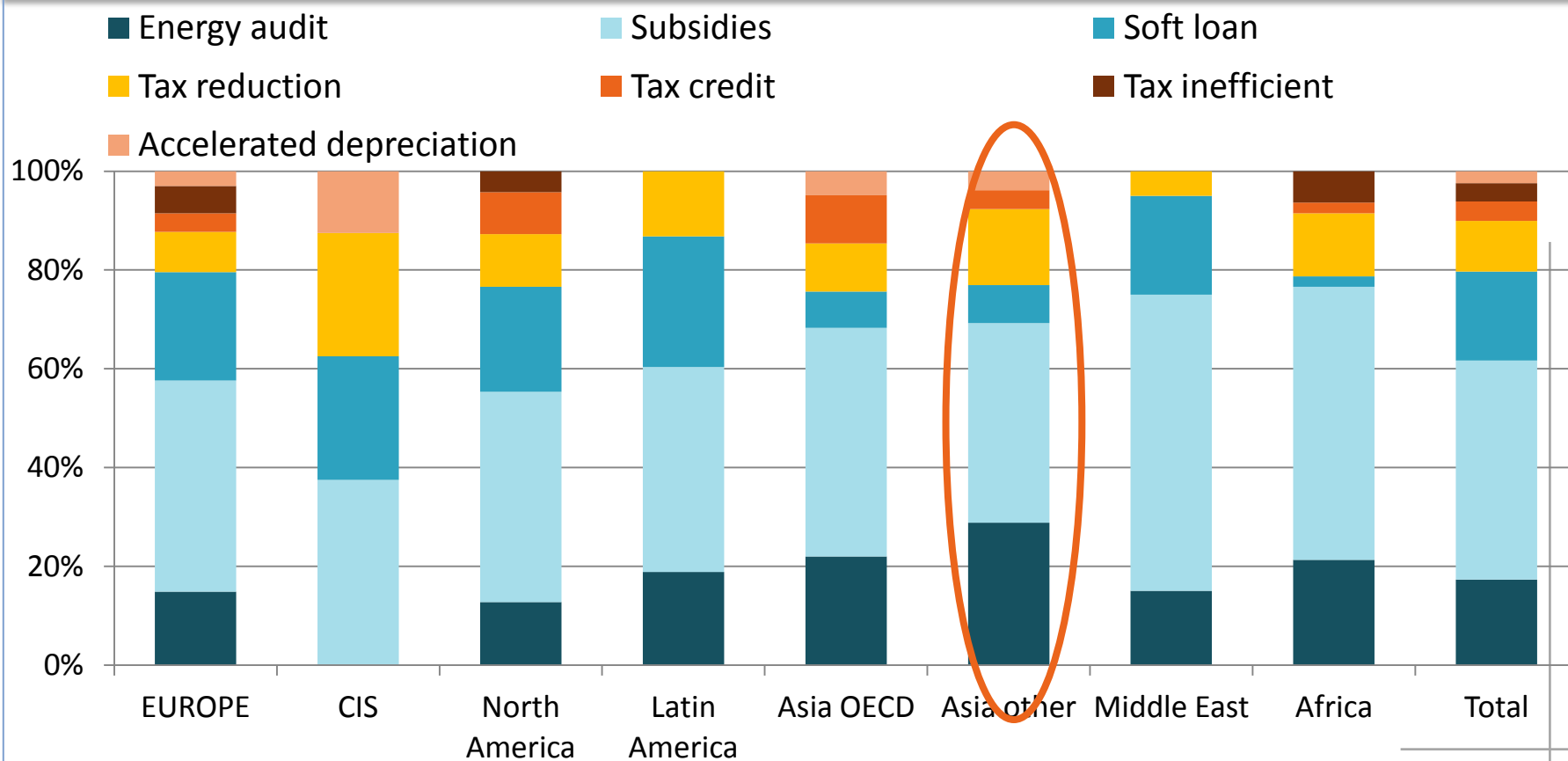
Financial incentives are dominant compared to fiscal measures in all regions, **Asia does not favour economic measures**

Countries with financial/fiscal measures



Among financial measures, investment subsidies are dominant and represent on average 60% of financial measures, followed by audit subsidies (~20%). Soft loans are more important in Europe/CIS, and America.

Distribution of financial measures by type and world region



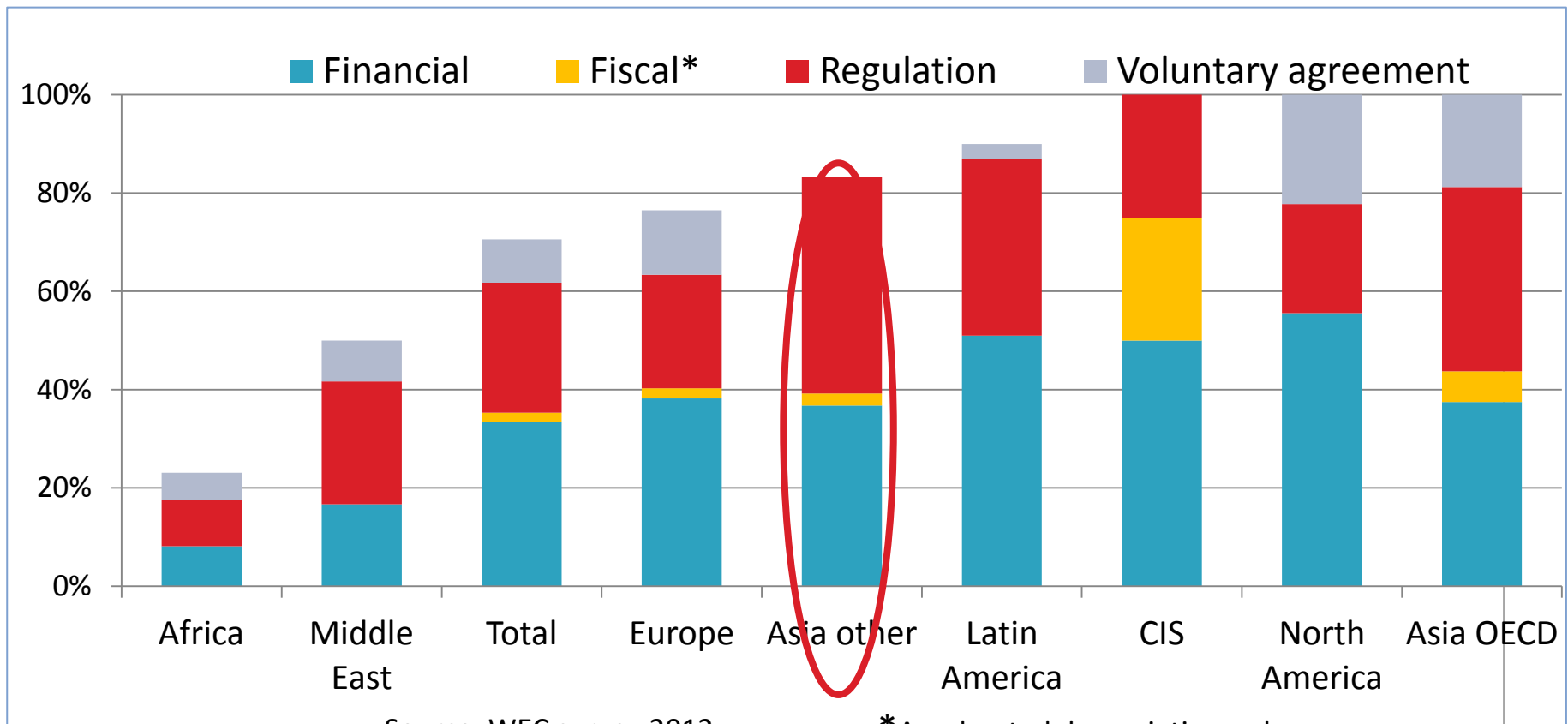
Source: WEC survey 2012

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On average 70% of countries have implemented measures in the industry sector, where incentives are dominant.

Some heterogeneities among WEC regions: **regulations are for instance dominant in Asia**

Measures on industry by type



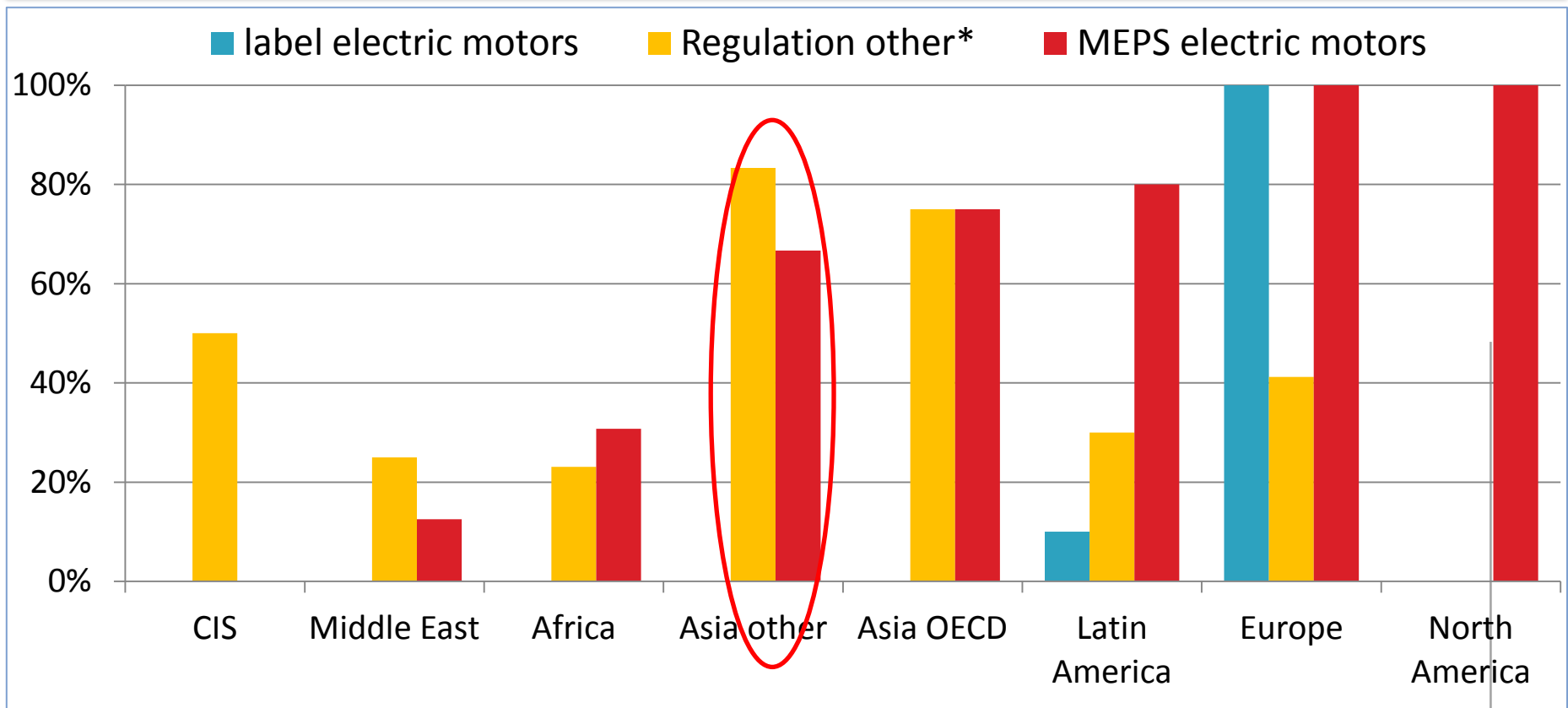
Source: WEC survey 2012

* Accelerated depreciation only

WEC - Overview of energy efficiency policies

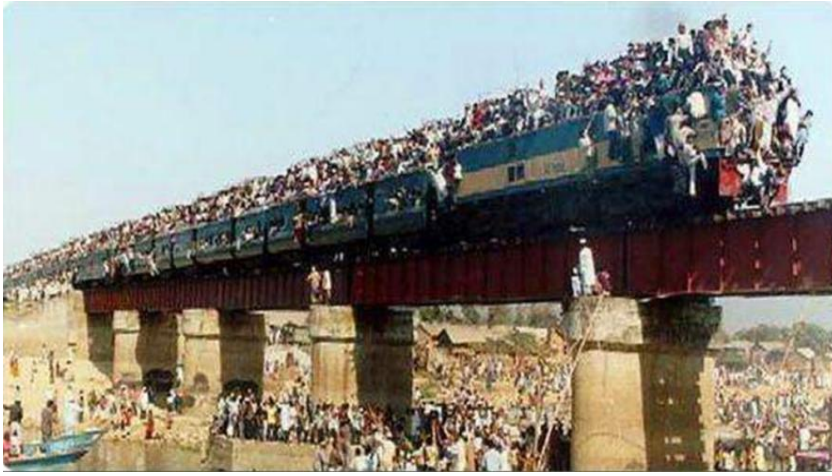
Labels on electric motors are rarely implemented, while MEPS is on average implemented in 65% of surveyed countries

Regulation in industry sector

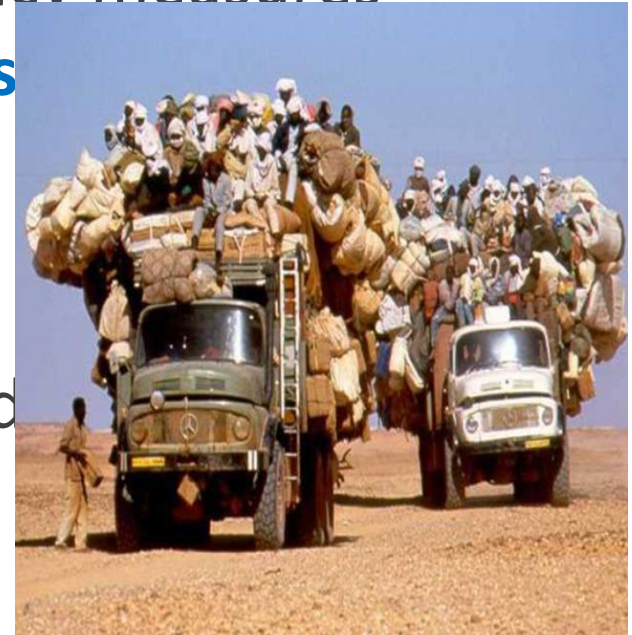


***Other: mandatory energy audits, mandatory energy managers, mandatory energy consumption reporting; mandatory energy savings plans, mandatory energy training**

Source: WEC survey 2012

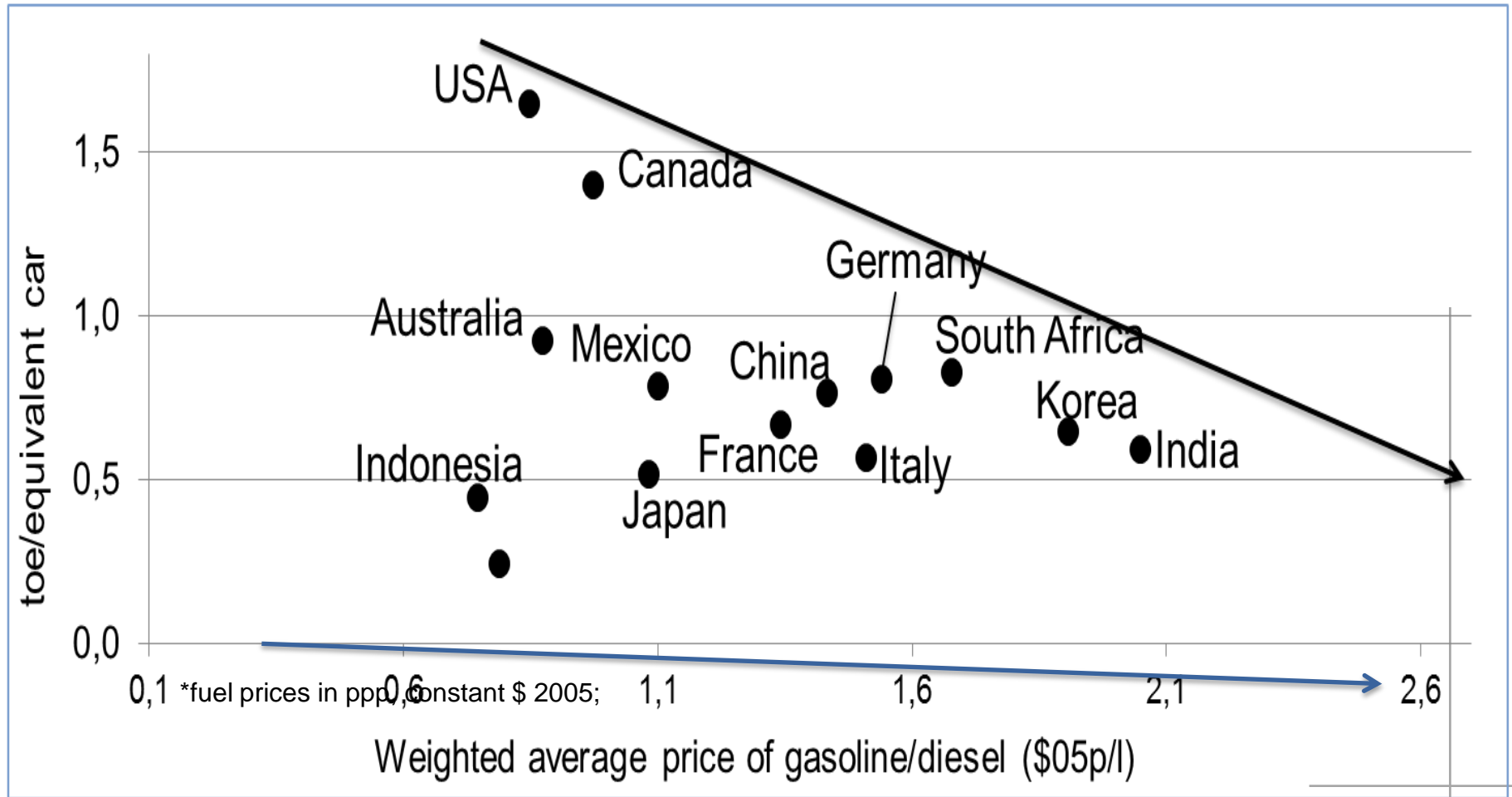


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Fuels prices play a role on unit consumption but other factors also influence trends and level of consumption per equivalent car

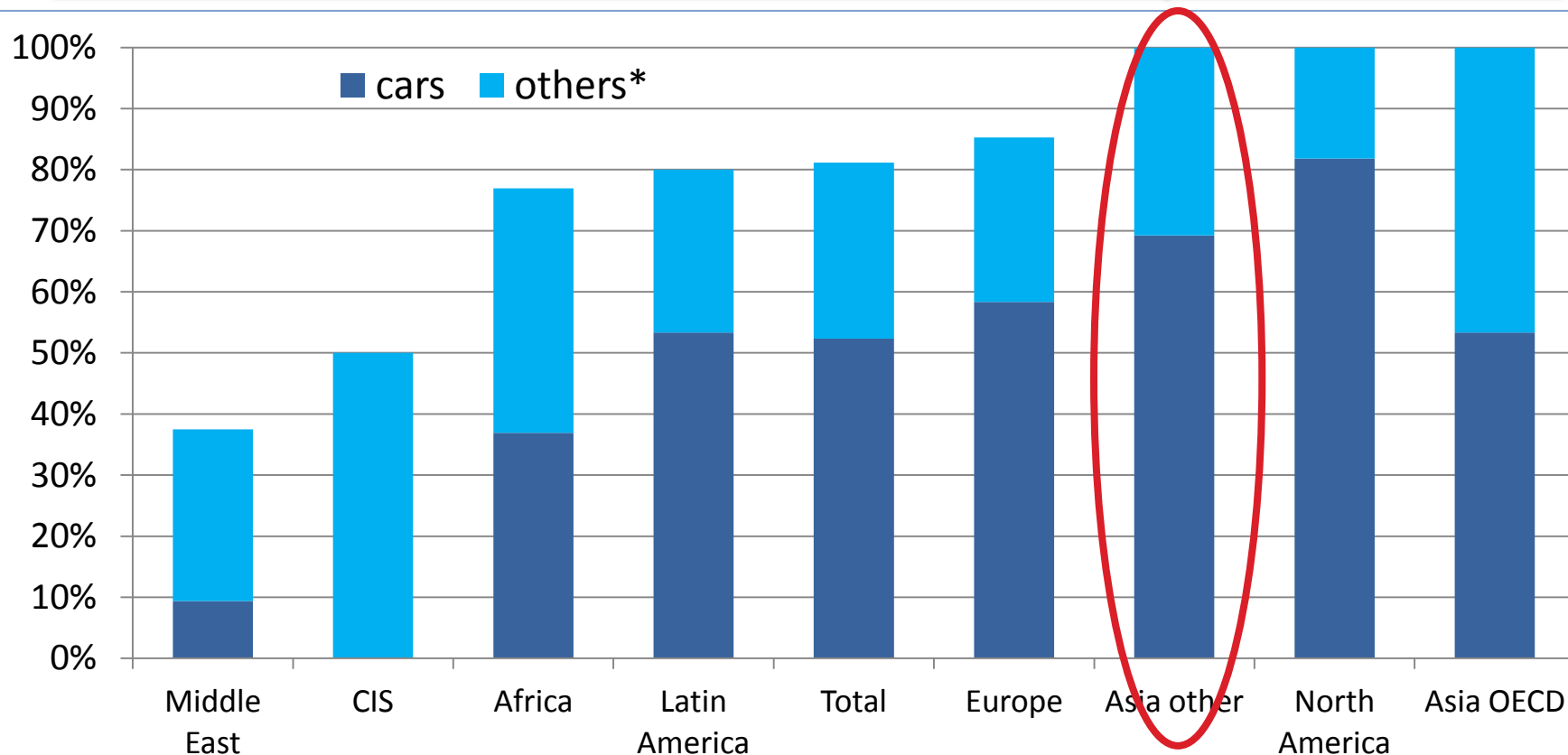
Energy Consumption of road transport per equivalent car and fuels prices* (2011)



Around 80% of countries have measures on transport:

Measures targeting cars (mainly new cars specifically) are dominant : more than half of countries have implemented measures on cars (except CIS and Middle East)

Countries with measures on transport

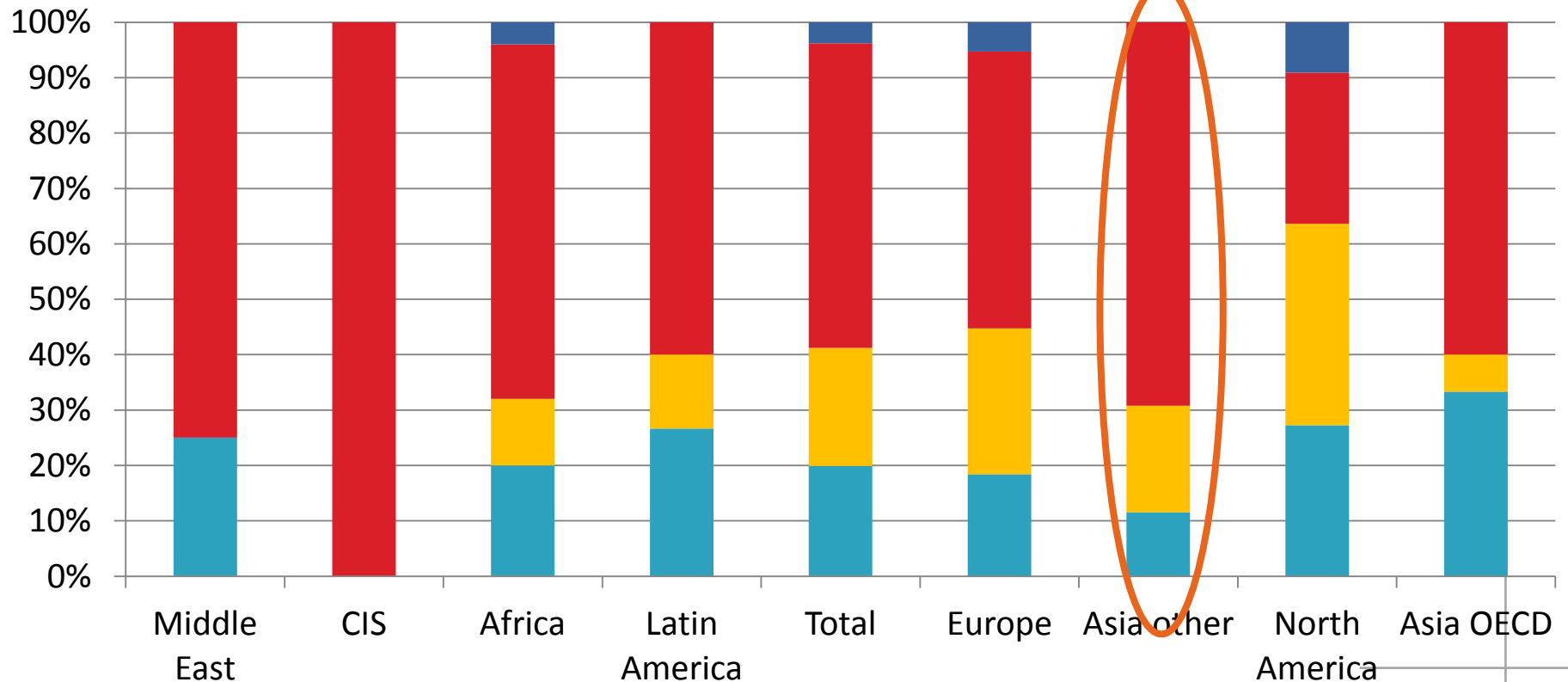


Source: WEC survey 2012

As a whole, regulation (e.g. labels on cars) are largely dominant. Financial (e.g. energy audit of transport companies or subsidies for efficient cars) and fiscal measures (e.g. tax reduction on cars) represent each on average 20%.

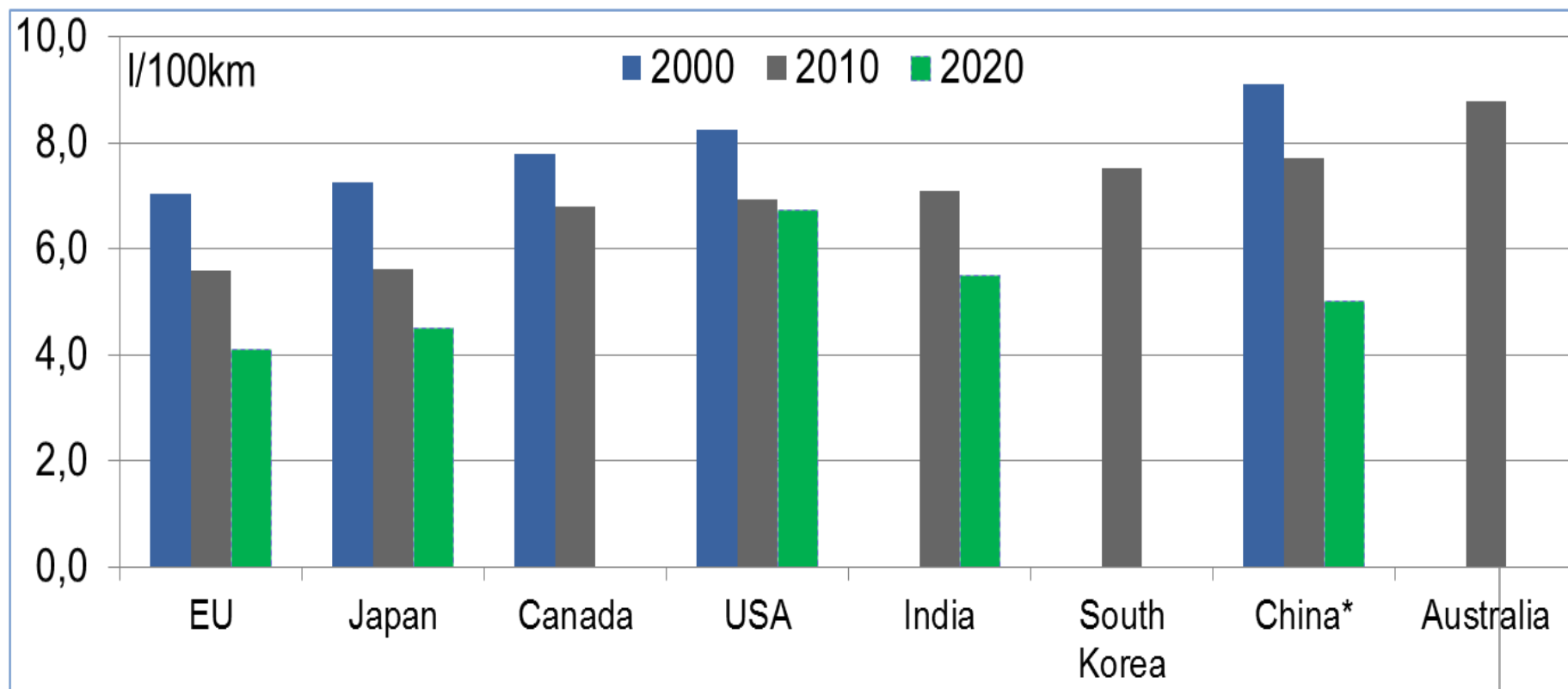
Distribution of transport measures by type

Financial Fiscal Regulation Voluntary agreements



Improvement of specific consumption of new cars resulting from P&Ms implemented : around 20% in the EU and Japan since 2000 linked to label, incentives, VA & Standards in EU; to top-runner program in Japan, progress ~15% in USA and China due to standards.

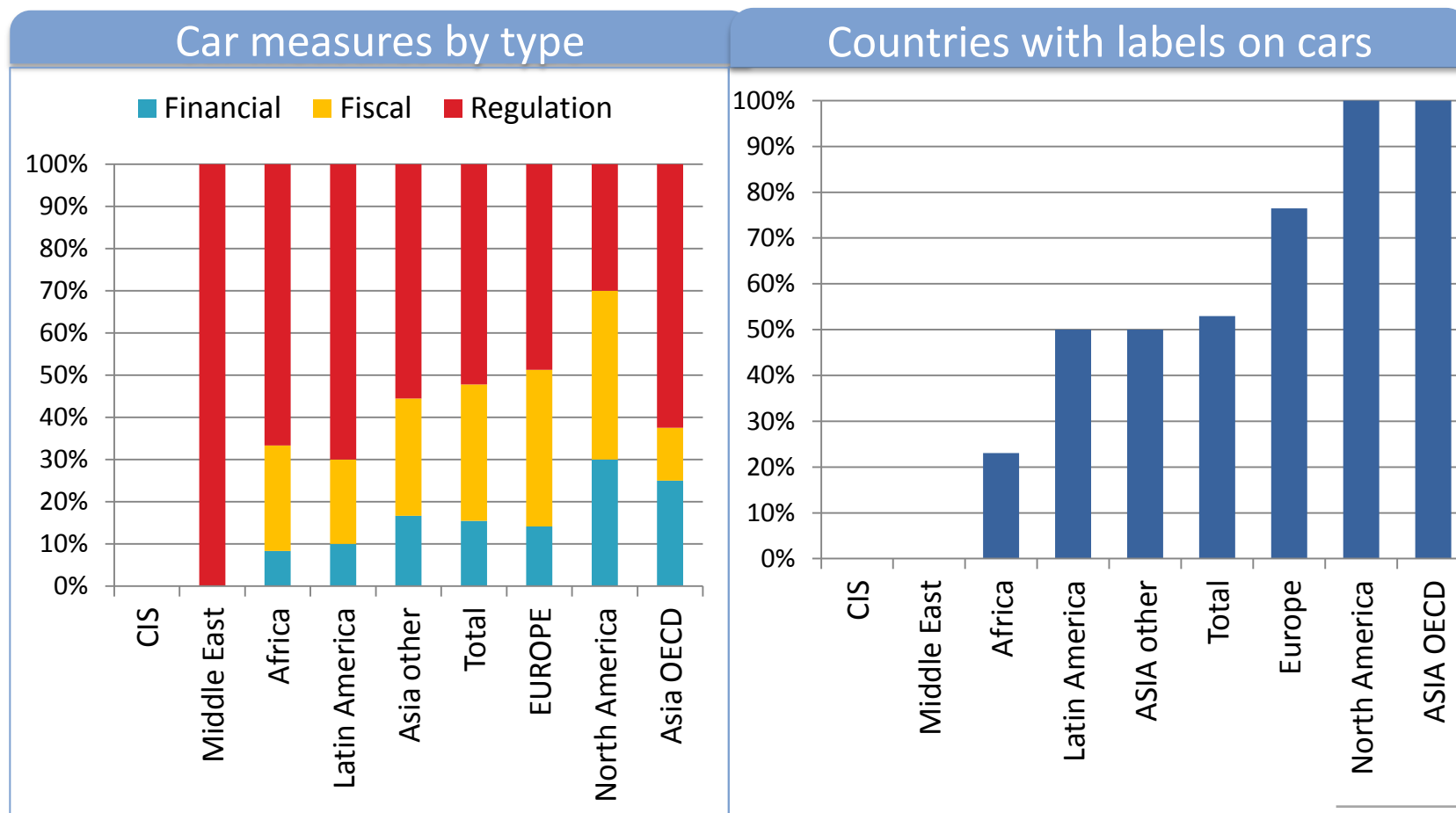
Specific Consumption of new cars



*Chine (2002-2010)

** Objectifs comparés à 2010

Regulations (e.g. labels) represent on average more than 50% of measures implemented on cars, and fiscal (e.g. car purchase tax based on CO2 performance) measures represents each around 35%.



Measures on trucks

- Regulation for transport companies such as mandatory audits ; mandatory energy managers, mandatory energy consumption reporting; mandatory energy savings plans; mandatory eco-driving;
- MEPS and labelling only implemented in Japan for heavy truck; not implemented elsewhere because of the heterogeneity of vehicles;
- MEPS and labelling exist for small trucks (vans) (e.g. EU, USA, Canada) for other countries;
- Regulation for truck components: e.g. speed regulator, tyre pressure monitoring systems (e.g USA since 2007);
- Subsidies.
- Speed limits



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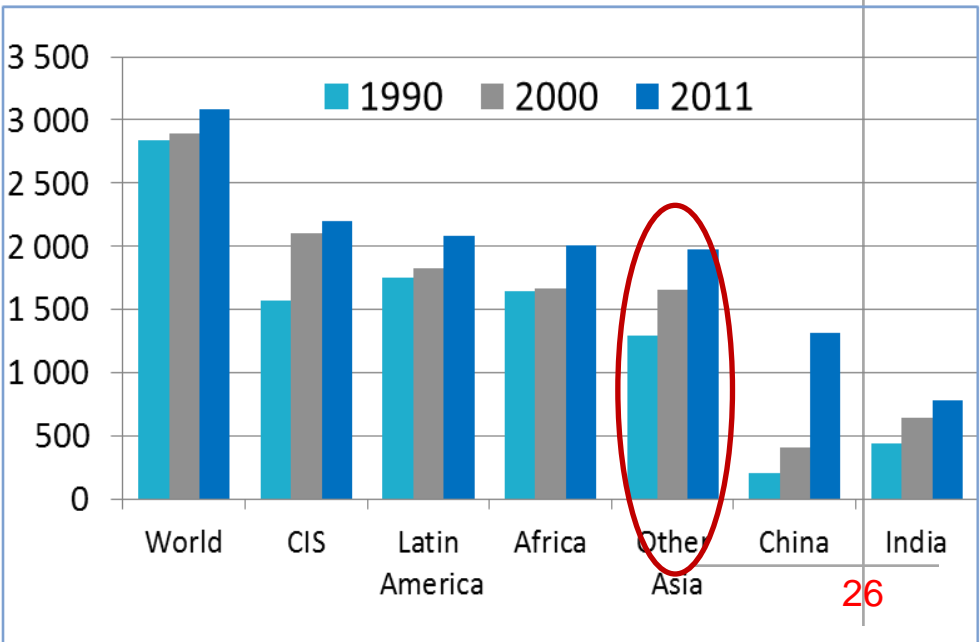
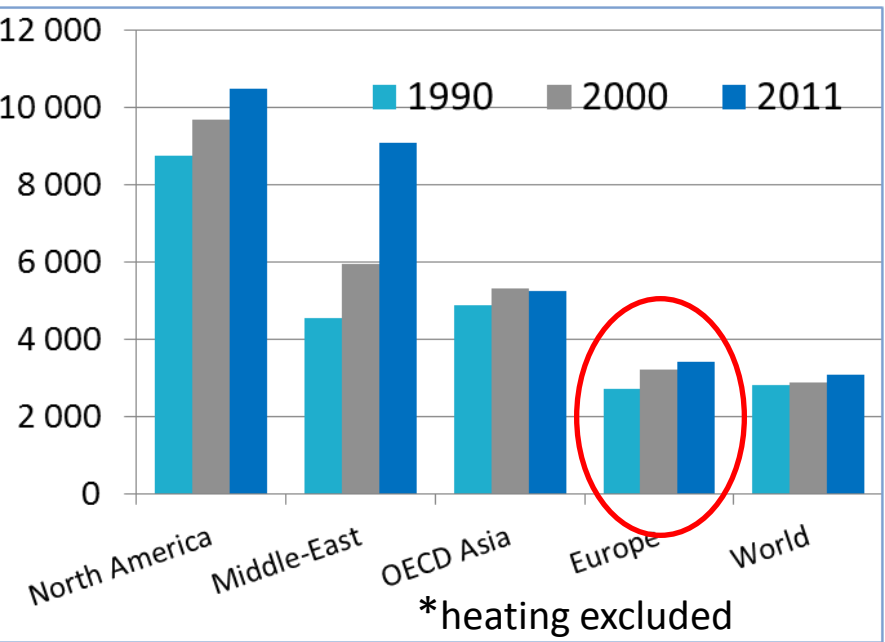


Increasing trends in almost all the regions due to new equipment penetration (AC, office equipment), more and larger equipment per households.

Low growth since 2000 in Europe and Asia OECD because of policies, as well as at world level because of increasing role of countries with low levels

Large discrepancies among regions: from around 10 000 kWh in North America to less than 1000 kWh for India and 1300 kWh in China.

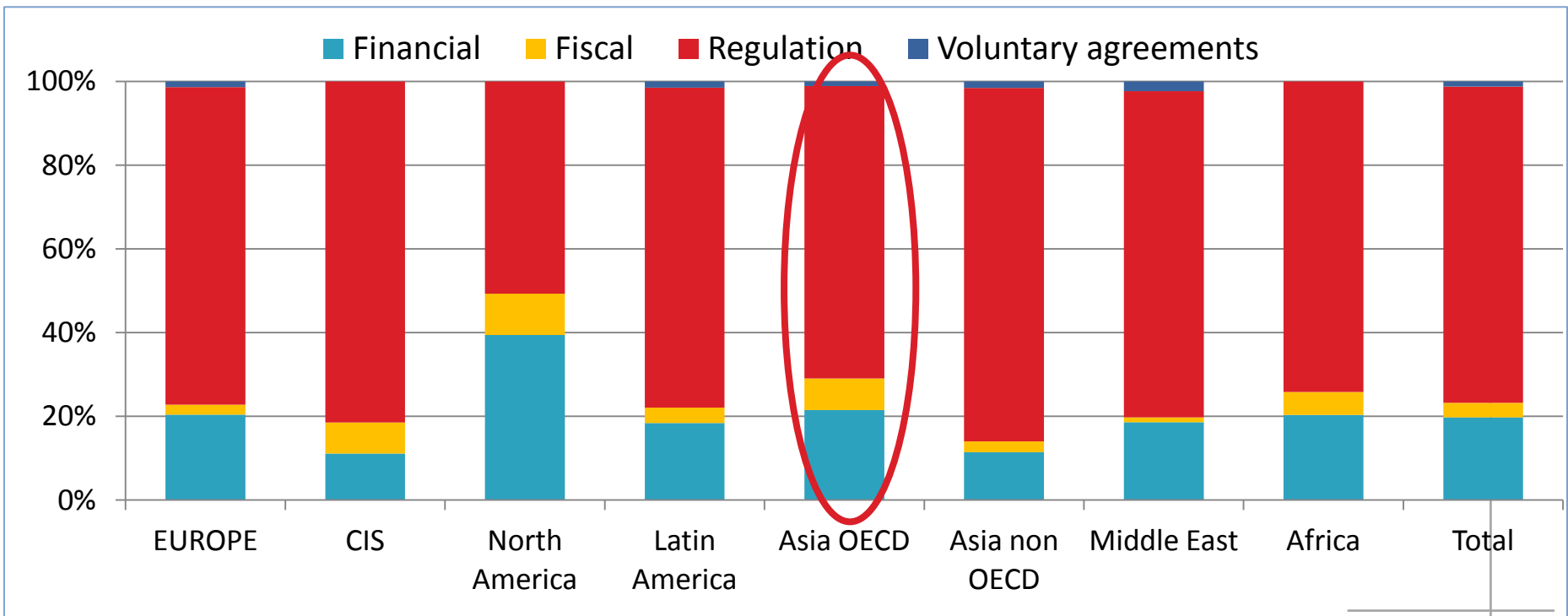
Consumption of electrical appliances* per electrified household (kWh/household)



Regulation: dominant measures in residential and service sectors

- Labeling & MEPS (or lamp banishment) are the dominant measures followed by financial measures (subsidies and soft loans) ; Fiscal measures (e.g. tax on inefficient appliances, or tax reductions) are marginal
- Very few voluntary agreements in commercial/public buildings

Measures on buildings by type



Building code is a crucial policy in the building sector.

60 countries (~70% of surveyed countries) have implemented building for new dwelling and in the tertiary sectors; 4 new countries for dwellings and 6 countries for the tertiary will implement building codes.

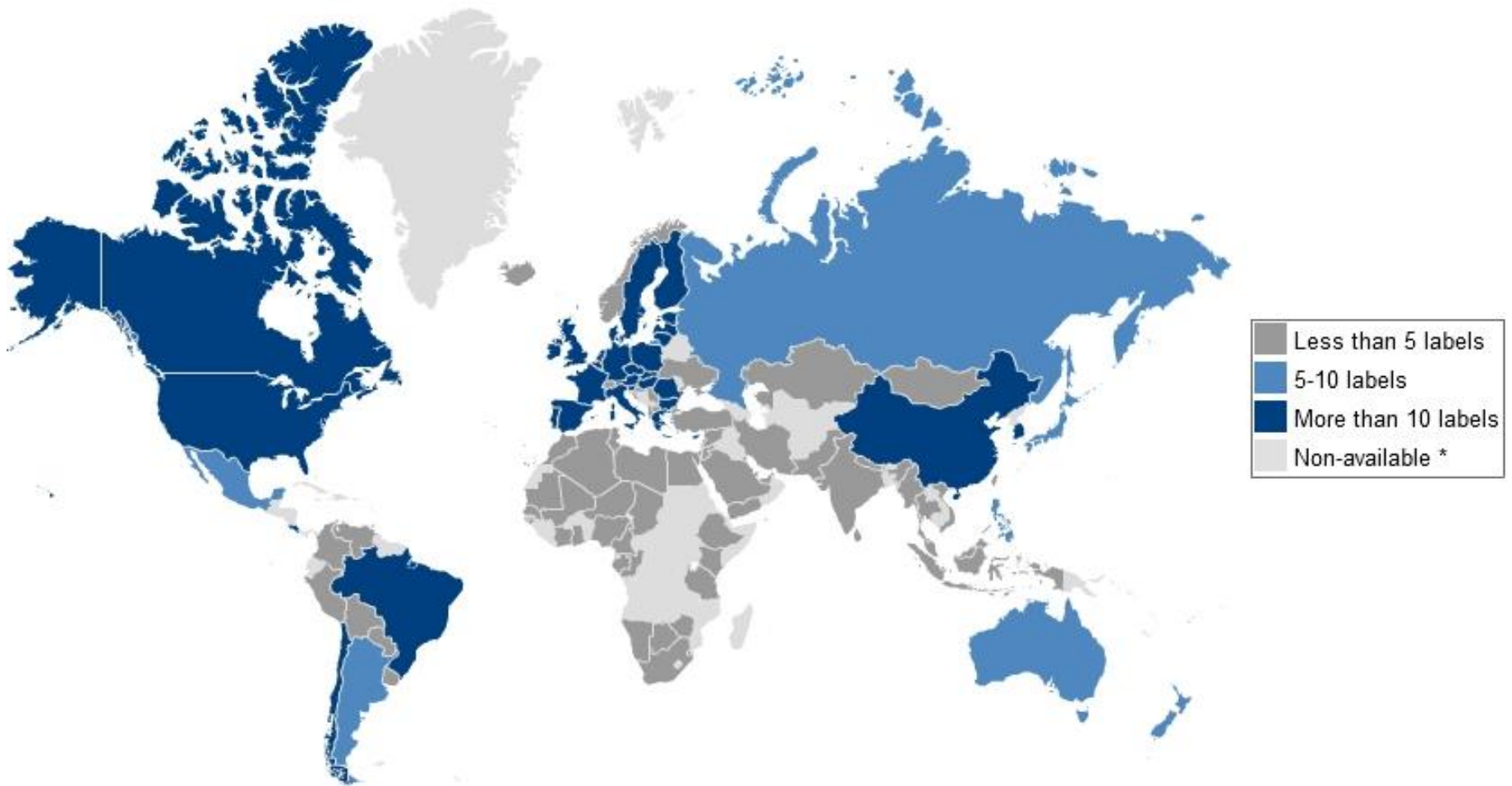
Building energy codes for new dwellings in residential



More and more countries have labels on energy efficient products and each country implements more and more labels.

Europe, China, South Korea, Brazil, Chile , USA and Canada have more than 10 labels.

Number of mandatory labels in households

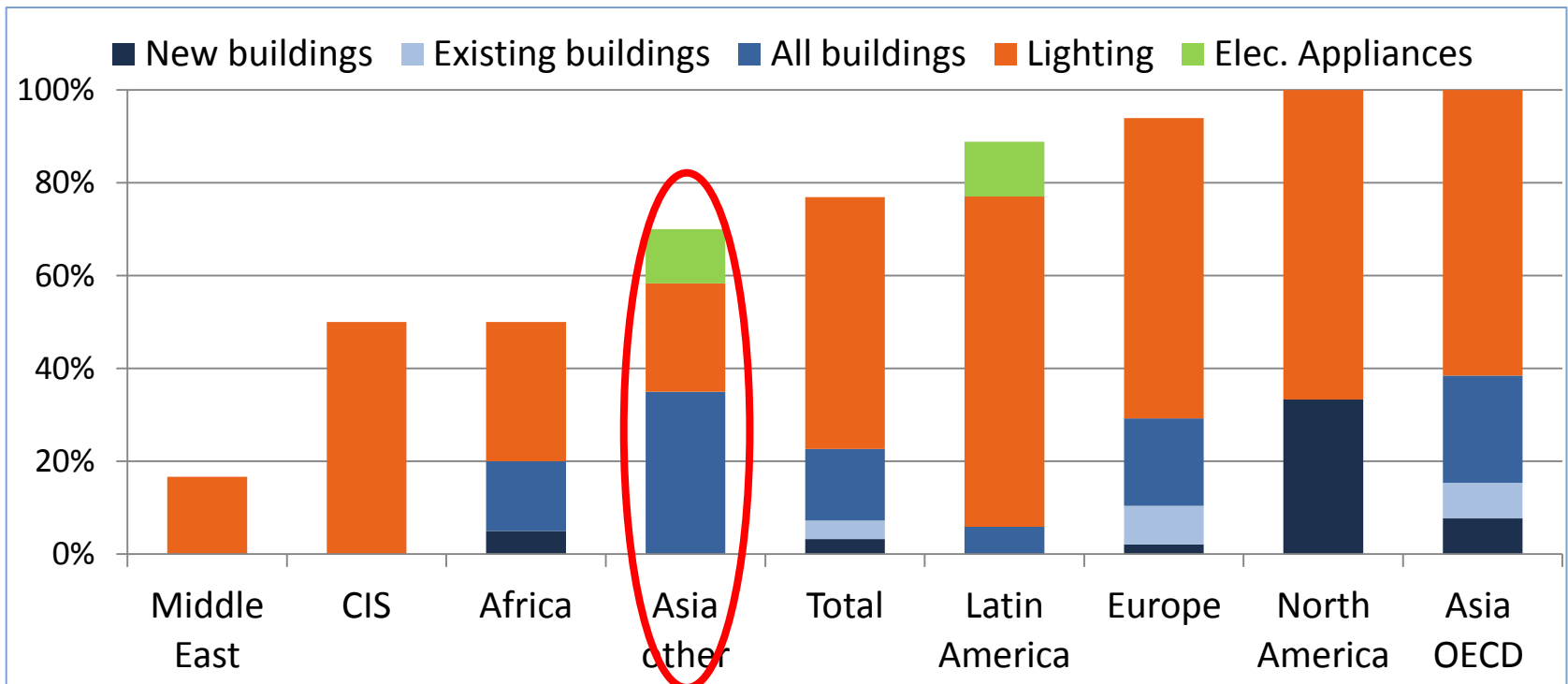


The banishment of incandescent lamps is widely applied (in 70% of surveyed countries)

Targets on energy efficiency of new/existing/all buildings are significant in Asia, north America and EU.

83% of targets concern residential, 13% public sector and 4% services

Countries with targets

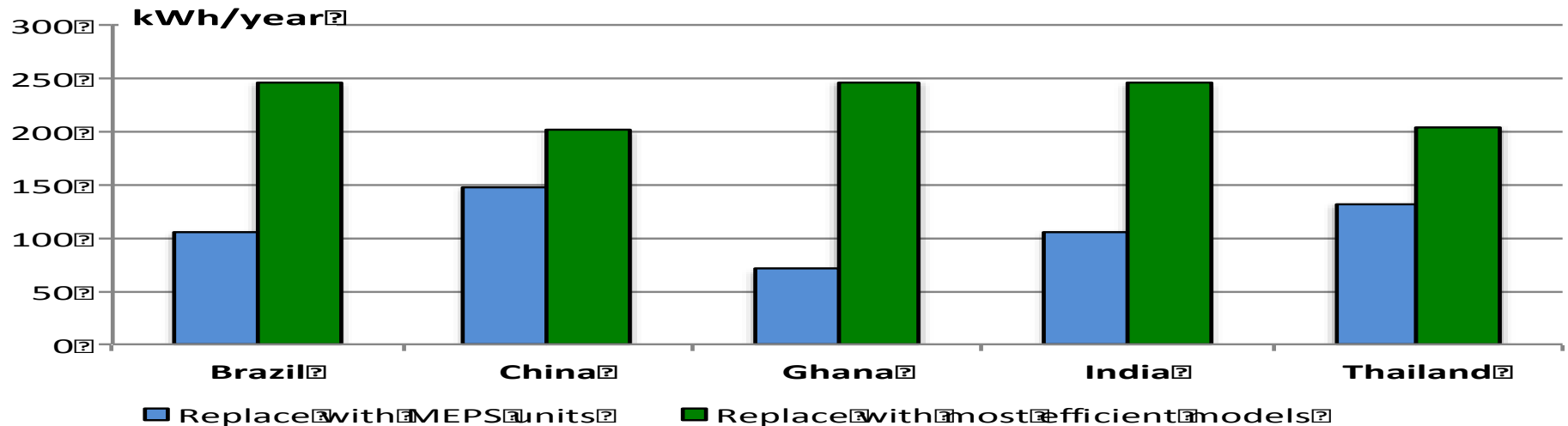


Source: WEC survey 2012

Case study : Labels and MEPS make the difference including in emerging countries



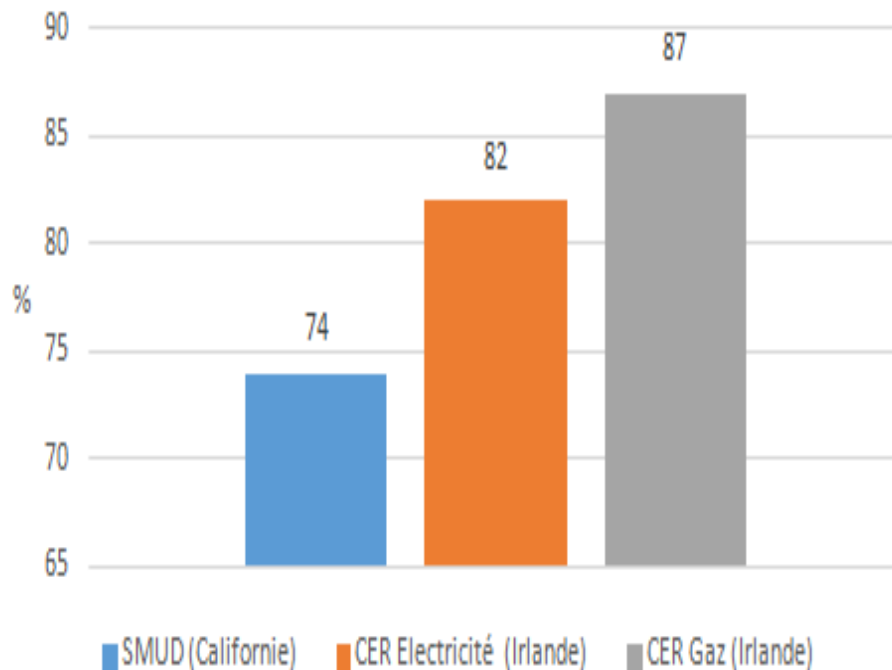
Electricity savings for new air conditioners



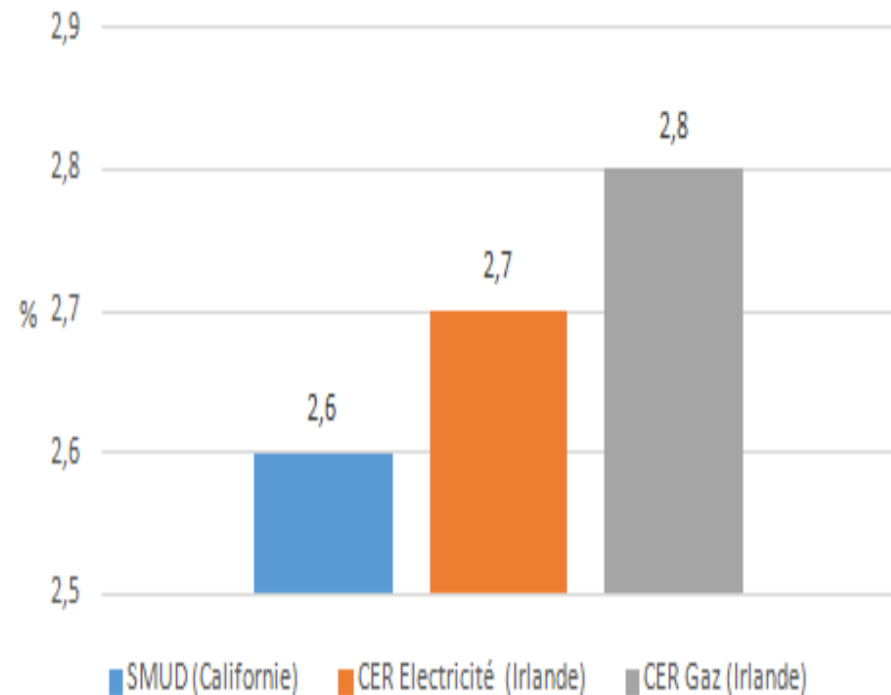
Case study : smart billing can impact consumer behaviour and contributes to reduce the electricity and gaz consumption (2,7%).

Households experiencing smart billing participate more to EE programs and have a better acceptance of dynamic tariffs

Pourcentage de consommateur qui ont changés leur habitudes de consommation en raison des factures évoluées



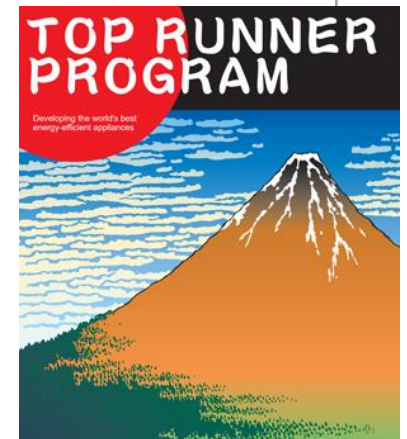
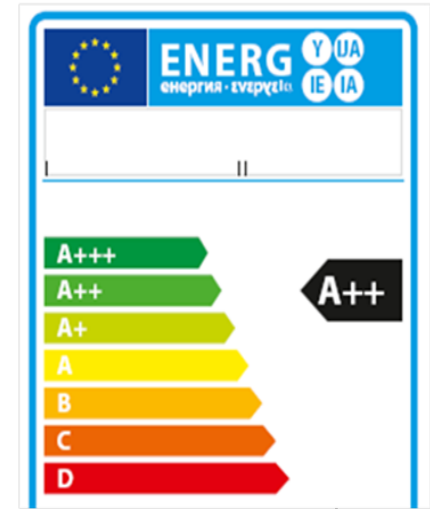
Impact des factures évoluées sur la consommation d'énergie des ménages



% baisse

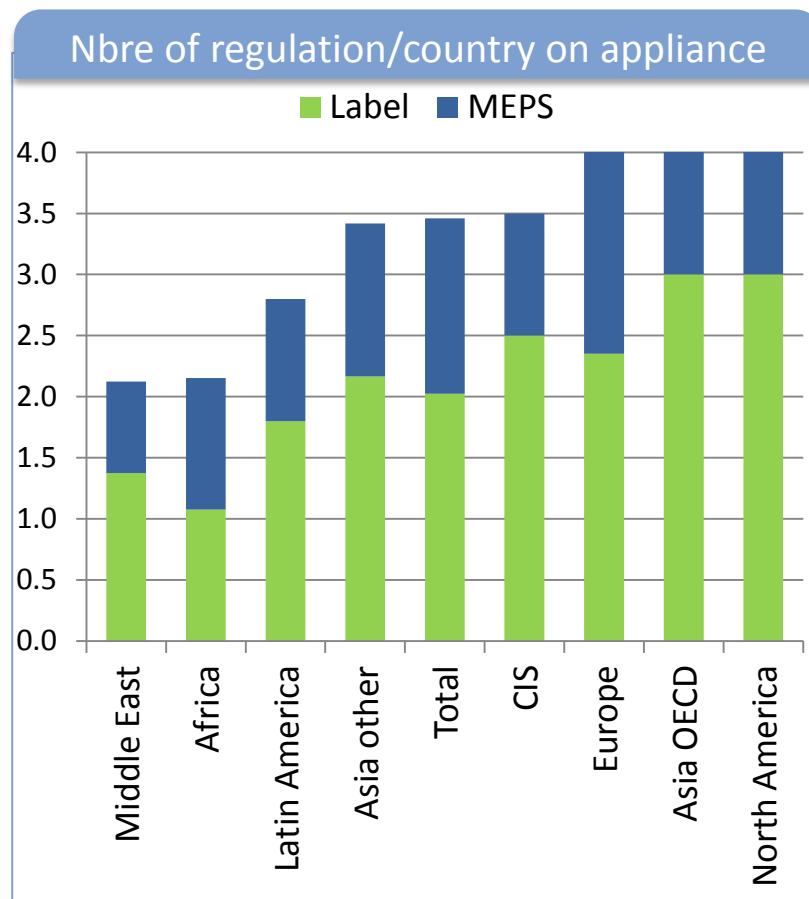
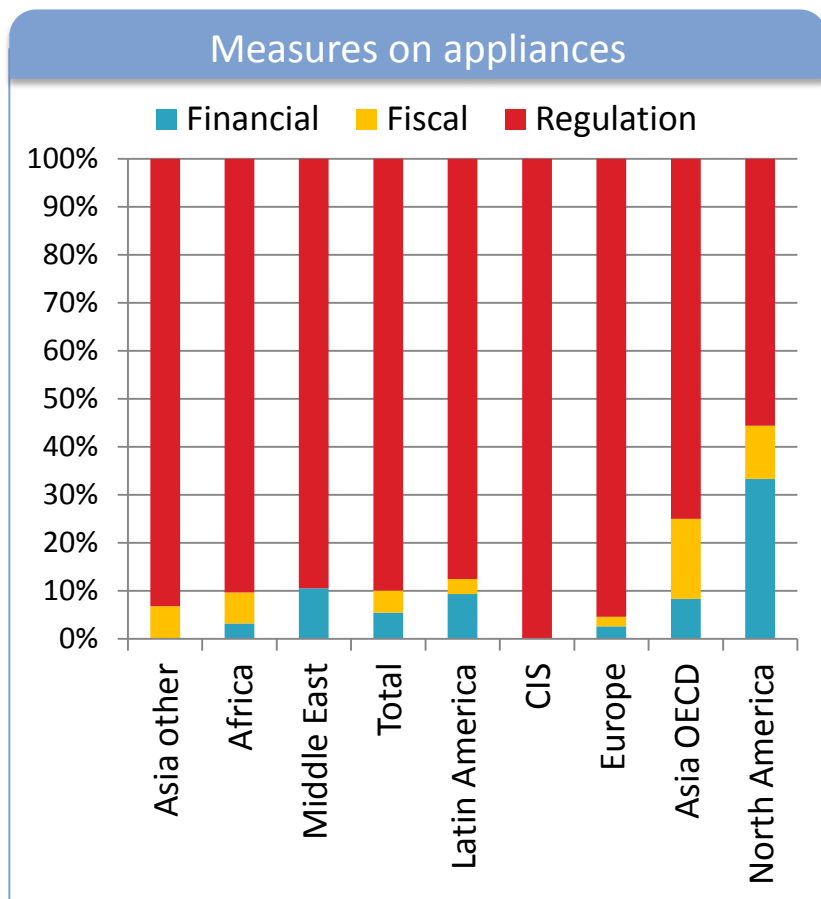
Measures on electrical appliances

- The most common measure is labelling, with an increasing number of appliances labelled (e.g. 9 in EU country, above ten 10 in Canada, China and Brazil, up to 19 in USA).
- Labelling to be effective should be mandatory which is the case in most countries → measure usually classified as regulation
- Dynamic labelling to create new efficiency class (e.g. EU with A+, A++ and A+++ to account for the fact that most of the sold appliances are already in the most efficient class (top runner programme in Japan))
- MEPS to remove the least energy-efficient products from the market → usually linked to label class
- Financial or fiscal incentives (i.e. subsidies or tax reduction) for efficient appliances are also quite common



Measures aiming at improving appliance* efficiency

Mandatory minimum energy efficiency requirement and mandatory energy labelling are the most important legislative measures addressing electrical appliances



Source: WEC survey 2012

WEC - Overview of energy efficiency policies

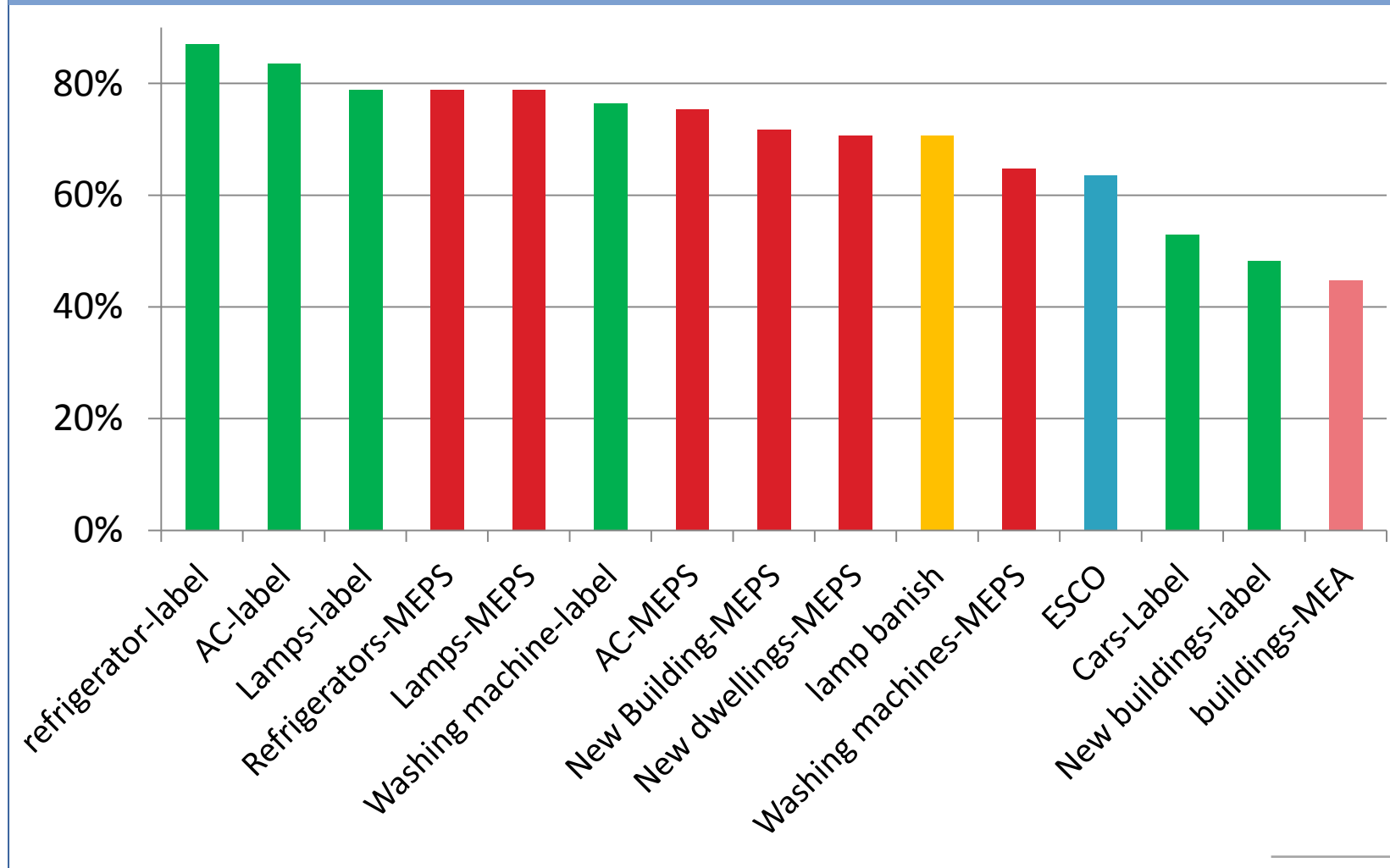
*Includes measures on refrigerator, washing machine, office equipment and other appliances

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WEC-Top 15 of energy efficiency measures

Labels & MEPS on household appliances are the most frequent measures...

WEC survey on energy efficiency policies: frequency of measures



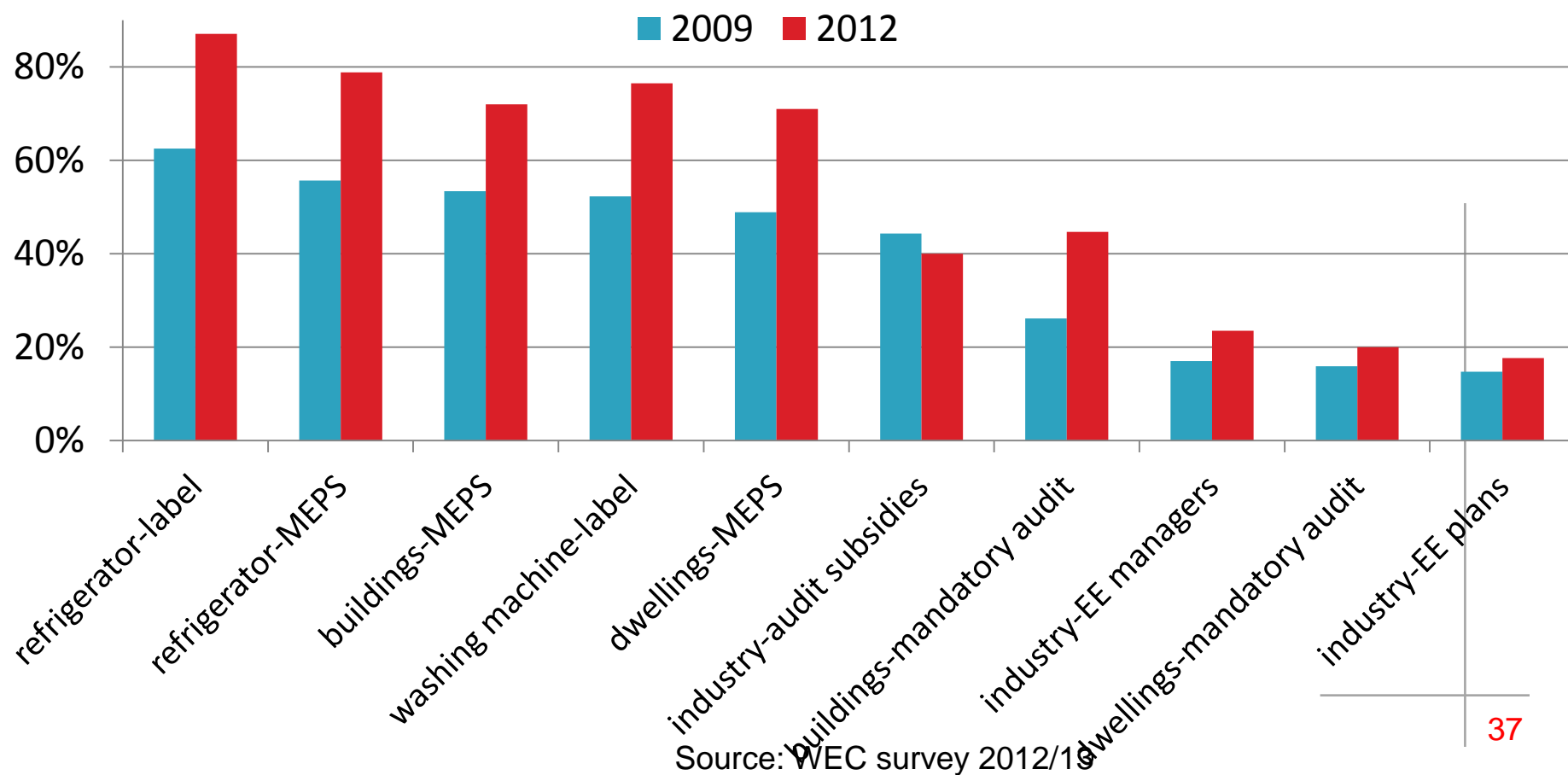
Source: WEC survey 2012 36

Building for non residential, dwelling for residential; MEA= mandatory energy audit

Energy efficiency policies implementation is increasing overtime including emerging countries

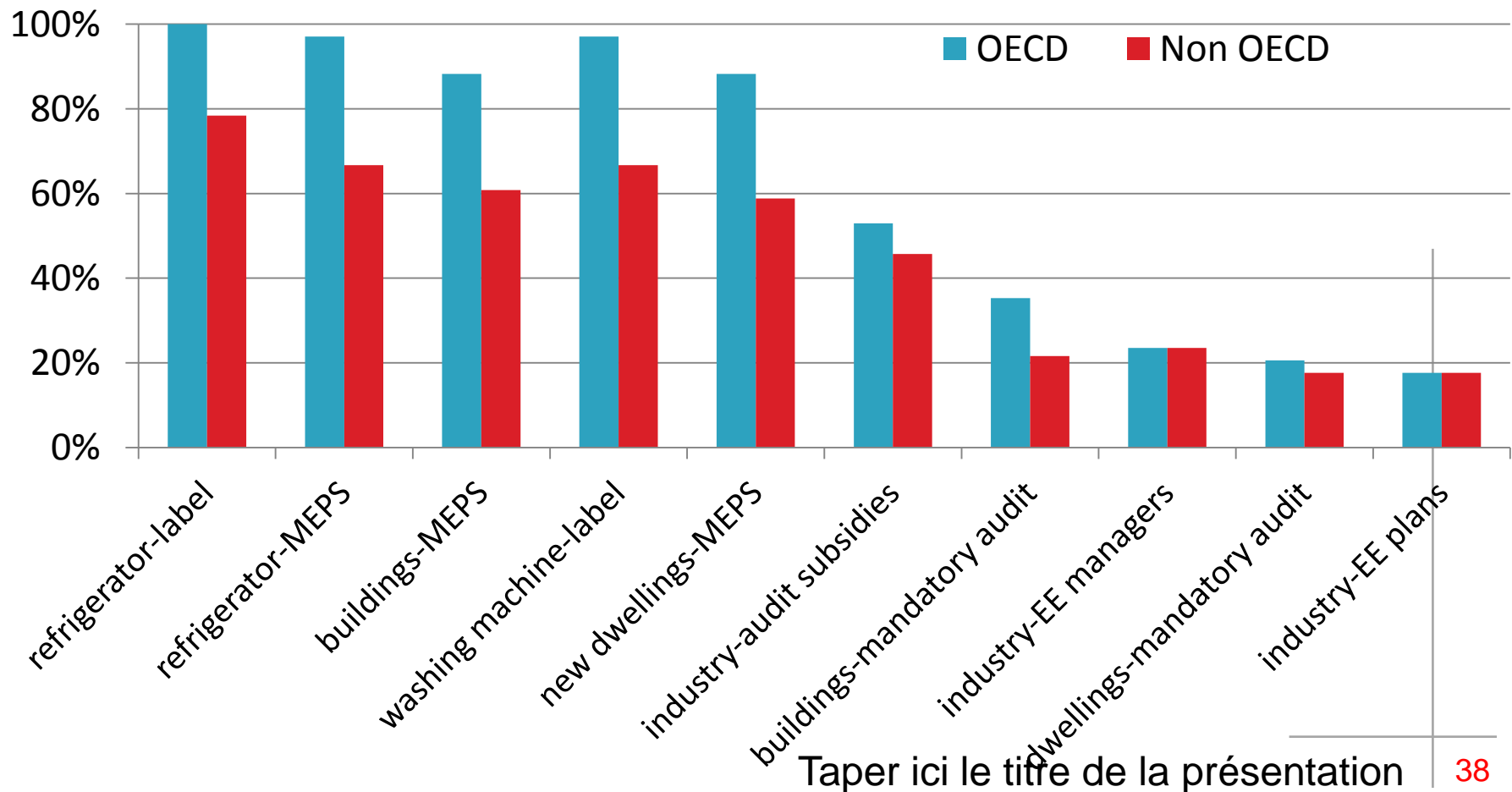
Number of measures is steadily increasing these last years

Energy efficiency policies : Frequency of implementation world wide



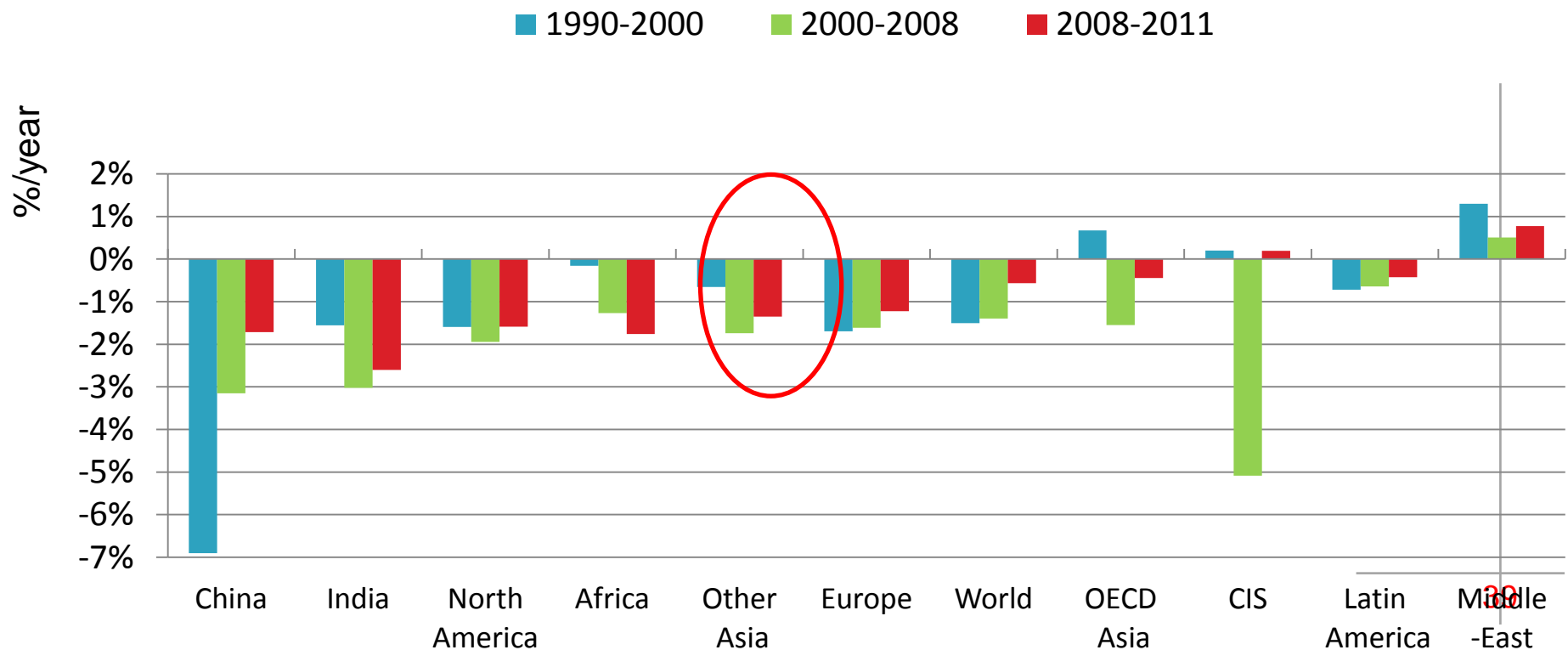
Emerging countries catch up the gap with OECD countries but their policy mix differs

WEC survey on energy efficiency policies - frequency of measures (2012)



- **Despite additional policies, slowdown of energy efficiency progress since 2008** (0.6%/year), partly due a structural effect, ie the fact that economic growth was stronger in regions with high intensities (eg China) and electricity growth
- **At world level, 1.3%/year average intensity reduction since 1990;**

Primary energy intensity by regions (1990-2011)



Recommendations on WEC on energy efficiency P&Ms implementation

- Energy prices should be adjusted real prices to give **the right signals to consumers**
- Consumers should be **informed** to be able to take the right decision.
- **Smart billing** provides a significative energy saving potential.
- **Innovative financing schemes** are needed to sustain **the consumer's investments**.
- **Quality** of high energy efficient equipments and services should be **verified**.
- **Regulations** should be properly implemented and **regularly reinforced**.
- **Consumer's behaviour** should be analysed and taken into account in particular due to the growing importance of TICs
- Energy efficiency trends should be **monitored** in order to assess the real impact of P&Ms.
- **Regional and international cooperation** in favour of energy efficiency should be reinforced.

1. Incentive prices

- Energy prices should be adjusted to long term marginal cost (growing in the future) to give the right signals to consumers ...
- But need appropriate measures to limit budget constraints for low income households.

2. Sustainable institutional support for policies and involvement

- Need for programmes with medium to long term, overall and sectoral quantitative targets and energy efficiency laws to give long-term signals to market actors and to have a sustainable regulatory framework: avoid stop and go

3. Innovative financing to support consumers at a limited cost for the public budget

- ✓ Dedicated and relevant budget for energy efficiency policies
- ✓ Energy efficiency funds (revolving, guarantee...) for EE investments
- ✓ Grouping of projects for multilateral funding (e.g. CDM projects)
- ✓ Energy savings obligations for utilities
- ✓ Public private partnership (e.g. ESCO's)
- ✓ Combined tax and subsidy schemes (e.g. "bonus malus")
- ✓ Zero or very low interest loans

4. Improving quality of EE equipment, services and practices to give confidence to consumers and avoid negative feedbacks

- ✓ **Certification of equipment, installers, auditors**
- ✓ **Quality control of locally produced and imported products, harmonisation of testing procedures for certification**
- ✓ **Economic support conditioned to quality labels**

5. Regulations should be regularly strengthened, enforced and expanded

- ✓ Dynamic revision of MEPS for buildings and equipment embedded in regulations
- ✓ Expand MEPS to a larger set of appliances
- ✓ Compliance and Random controls integrated in regulations

6. For each end-use , address all steps of the deployment process of energy efficient equipment /actions with packages of measures rather than single measures

- ✓ Combination of different measures (e.g. information & communication, regulations, subsidies, soft loans, training, certification);
- ✓ Complementary or alternative measures

7. Better address the situation of less developed countries

- ✓ Regulations on second-hand appliances and cars (including ban)
- ✓ Adapted incentives for efficient biomass stoves and CFL
- ✓ R&D in improved biomass stoves and solar cookers
- ✓ Capacity building

8. Address behaviours as much as technology

- ✓ Study and take into account the impact of behaviours
- ✓ Develop technologies that can limit the impact of inefficient behaviours (e.g. speed limiters, programme set to saving modes)
- ✓ Promote informative billing and in house display devices
- ✓ Improve communication tools
- ✓ Develop training activities

9. Need to monitor achievements and impacts of measures

- ✓ Develop data collection system for end-uses
- ✓ Develop energy efficiency indicators to monitor progress achieved on a yearly basis
- ✓ Evaluate the measures that work and do not work to better tune them; evaluate rebound effects, free rider effects

10. Enhance international and regional cooperation : towards regional policies and programmes

- ✓ Regional certification and international standard
- ✓ Regional benchmarking
- ✓ Regional testing facilities
- ✓ Exchange of experience on measures
- ✓ Common and harmonised data collection at regional levels
- ✓ Encourage institutional cooperation

Outcomes :

1. **Internet interactive data base on EE and CO2 indicators and data mapper;**
2. **Internet interactive database on P&Ms and data mapper;**
3. **Report (100 p.) (sectoral analysis + recommendations);**
4. **Synthesis report (15 pages) english and french;**
5. **4 study cases on good practises (english) (40 pages);**
6. **40 2 pages sheets on good national practicesd (competing the existing portofolio of 40 polcies and accessible via the P&Ms data basee);**
7. **Website (WEC and ADEME);**
8. **Article in the WEC insight review**

<http://www.worldenergy.org>

<http://www.worldenergy.org/data/energy-efficiency-policies-and-measures>



Thank you for your attention

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<http://www.worldenergy.org>

<http://www.worldenergy.org/data/energy-efficiency-policies-and-measures>