



# The Raw Materials Initiative & Recycling

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**European Commission**  
Enterprise and Industry



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Metals, Minerals, Raw Materials



# Content

- What is the Raw Materials Initiative (RMI)?
- RMI – Political & Economic Context
- Defining Raw materials Critical to the EU (& Link with Recycling)
- Way Forward





# What is the Raw Materials Initiative (RMI)?

- Initiative launched by Commission with Communication in November 2008
- Aim to highlight importance of sustainable access to raw materials for the future of EU
- Strategy included primary and secondary raw materials and focussed on metals and minerals – Three pillar approach

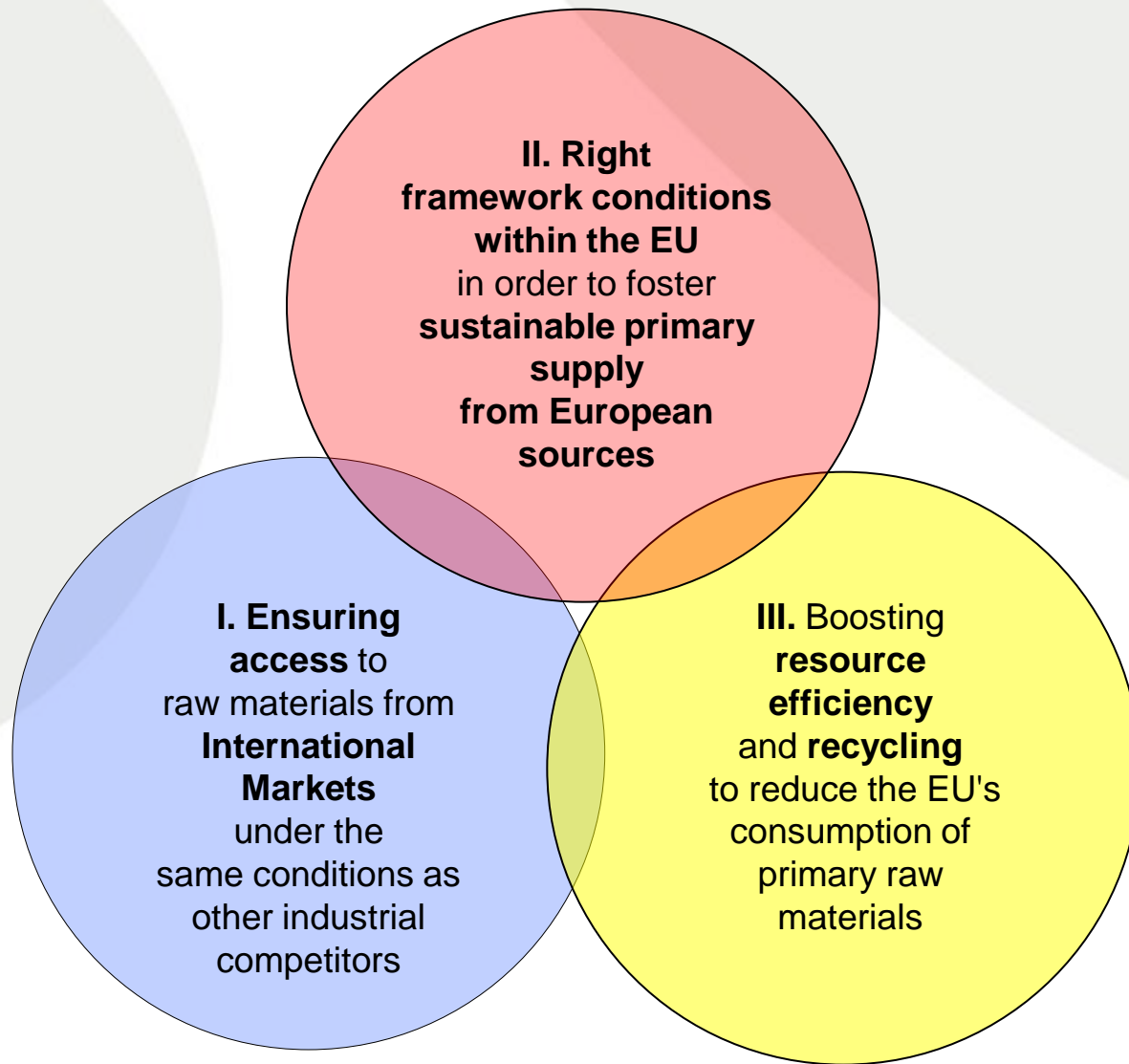




# Main Challenges (RMI Three Pillars)

- EU highly dependent on imports of important raw materials which are increasingly affected by **market distortions**
- Still potential in Europe, but exploration and extraction face **increased competition** for different land uses and a highly regulated environment
- Large potential from EU's "**Urban Mines**" (e.g. Recycling) not exploited in full; also possibilities for improved material efficiency and substitution







# Main scope of RMI

- First Pillar:
  - Trade restrictions, development co-operation, metals markets
- Second Pillar:
  - Land use policies in EU, geological/minerals data, authorisations, administration etc
- Third Pillar:
  - Resource/Material Efficiency, Substitution, **Recycling**





# Political & Economic Context





# Political developments following the launch of the RMI in 2008

- **Council** Conclusions of May & December 2009 and March 2010 **endorsed** overall thrust and objectives of RMI
- Raw materials as essential component of **Europe 2020 Strategy** and **EU industrial policy**
- Heightened importance of raw materials in **international fora** (G20; UNCSD; EU-Africa Relations etc)





# Importance of RMs for Modern & Emerging Technologies (1): Example of Emerging Uses

<b>Raw material</b>	<b>Emerging technologies</b>
Antimony	micro capacitors
Cobalt	Li-ion batteries, synthetic fuels
Gallium	Thin layer photovoltaics, WLED
Germanium	Fibre optic cable, optical technology
Indium	Displays, thin layer photovoltaics
Platinum (PGM)	Fuel cells, catalysts
Palladium (PGM)	Catalysts, seawater desalination
Niobium	Micro capacitors, ferroalloys
Neodymium (RE)	Permanent magnets, laser technology
Tantalum	Micro capacitors, medical technology



# Emerging technologies (2):

## Illustrative table based on Fraunhofer work

Raw material	Production 2006 (t)	Demand emerging tech. 2006 (t)	Demand emerging tech. 2030 (t)	Demand/prod 2006	Demand/prod 2030
Gallium	152	28	603	0.18	3.97
Indium	581	234	1.911	0.40	3.29
Germanium	100	28	220	0.28	2.20
Neodymium	16.800	4.000	27.900	0.23	1.66
Platinum	255	very small	345	0	1.35
Tantalum	1.384	551	1.410	0.40	1.02
Silver	19.051	5.342	15.823	0.28	0.83
Cobalt	62.279	12.820	26.860	0.21	0.43
Palladium	267	23	77	0.09	0.29
Titanium	7.211.000	15.397	58.148	0.08	0.29
Copper	15.093.000	1.410.000	3.696.070	0.09	0.24



# Rare Earth Elements





# EU Work on Defining Critical Raw Materials & Link to Recycling



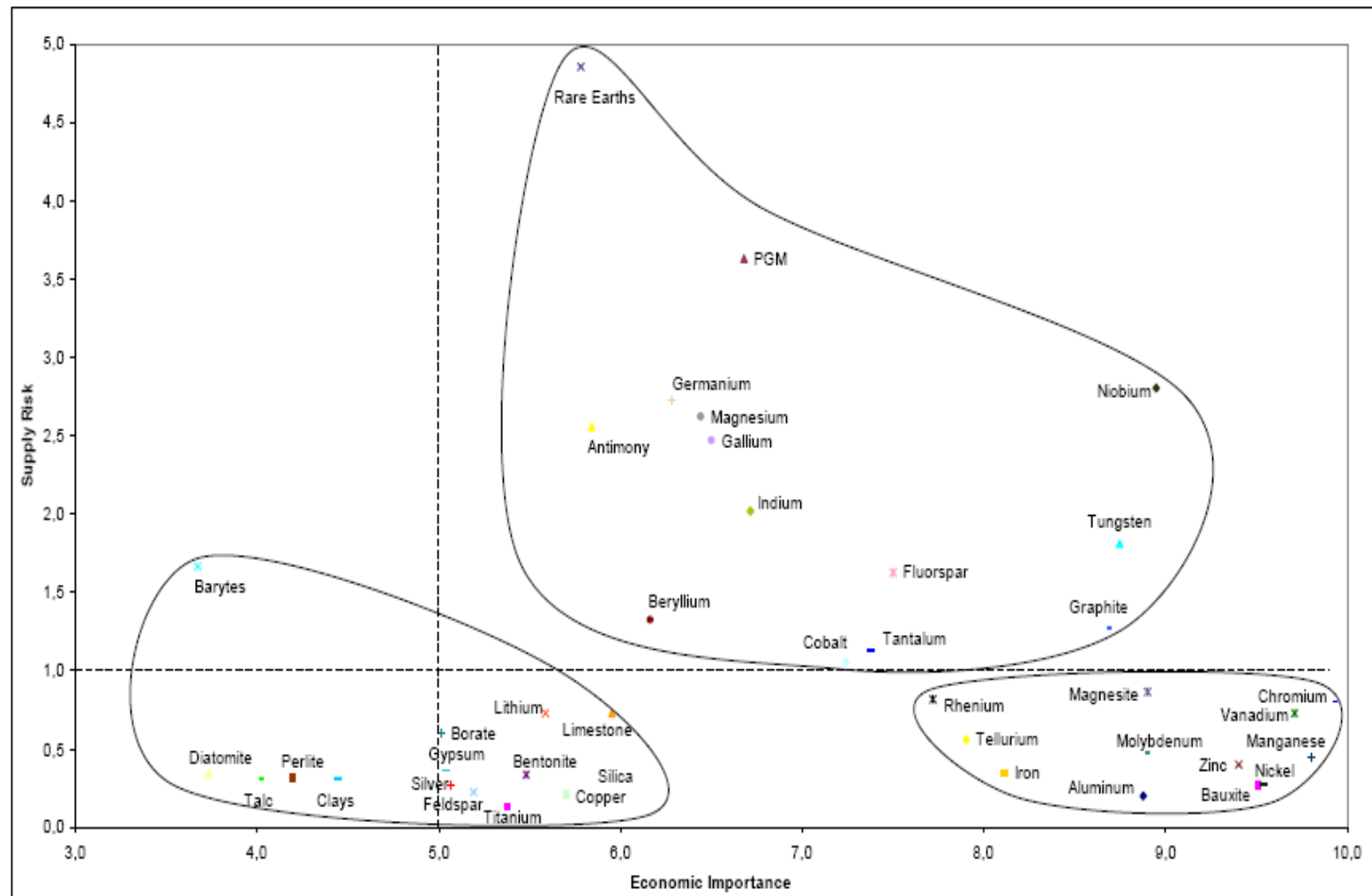


# Defining Critical Raw Materials

- Analysis supports three-pillar analysis
- Conducted by stakeholder WG
- 41 raw materials analysed
- Three main aggregated **indicators**:
  - economic importance,
  - supply risks,
  - environmental country risks
- Transparent methodology
- Based on 2006 data
- Foreseen to be updated regularly

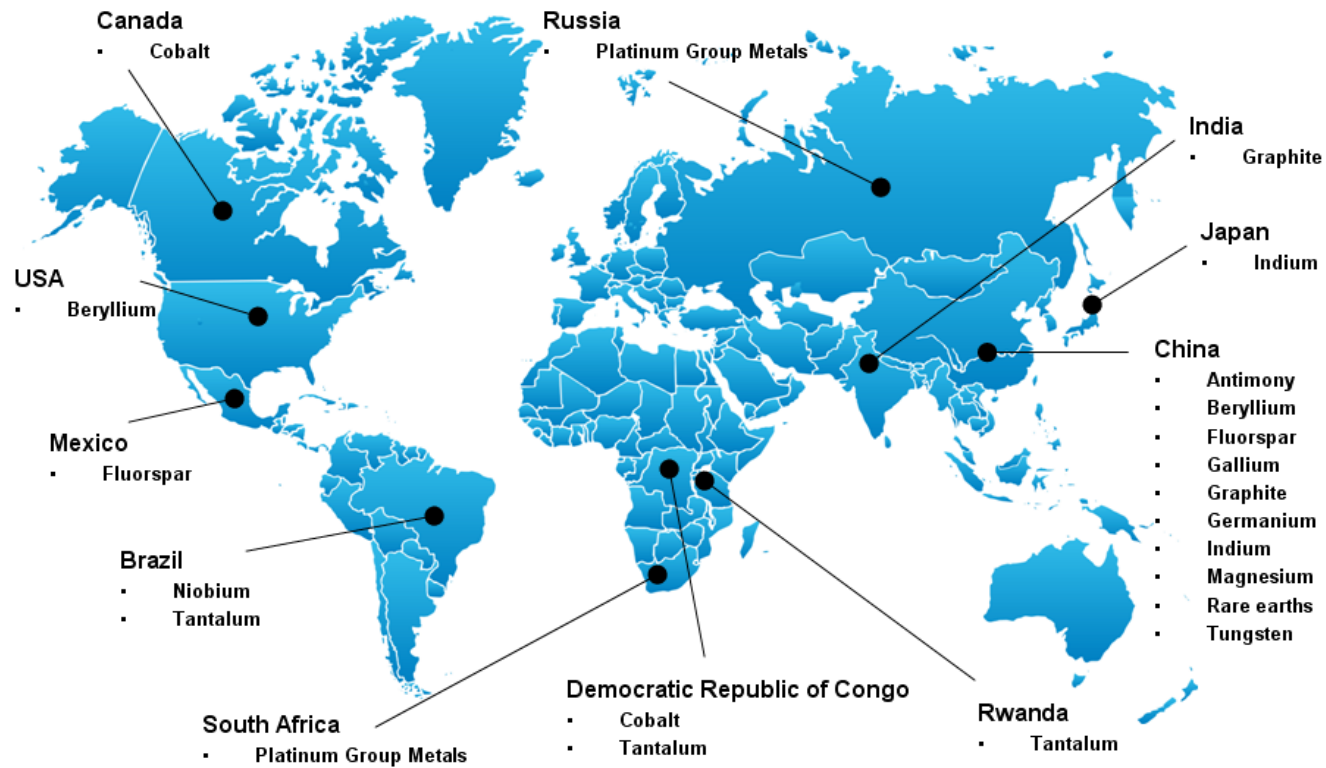


# List of Critical Raw Materials



# Critical raw materials

## Production concentration of critical raw mineral materials





# Critical Raw Materials – Supply Side

- High supply risks due to:
  - High share of the worldwide production in:
    - China (antimony, fluorspar, gallium, germanium, graphite, indium, magnesium, rare earths, tungsten)
    - Russia (Platinum Group metals)
    - Congo (cobalt, tantalum)
  - **And** low substitutability and recycling rates

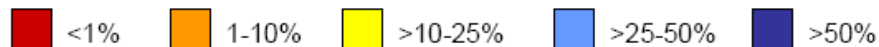


# Global Average Recycled Content – All metals

Source: UNEP Study

1 H																	2 He
3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
55 Cs	56 Ba	*	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
87 Fr	88 Ra	**	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Uub	113 Uut	114 Uuq	115 Uup	116 Uuh	(117) (Uus)	118 Uuo

* Lanthanides	57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
** Actinides	89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr



# Electronics, Recycling & Precious Metals

Source: Draft UNEP Study

EOL Recycling Rates		Sector-specific EOL recycling rates					Jewellery, coins
	1)	Vehicles 2)	Electronics	Industrial applications 3)	Dental	Others 4)	
Au	15-20	0-5	10-15	70-90	15-20	0-5	90-100
Ag	30-50	0-5	10-15	40-60		40-60	90-100
Pt	60-70	50-55	0-5	80-90	15-20	10-20	90-100
Pd	60-70	50-55	5-10	80-90	15-20	15-20	90-100
Rh	50-60	45-50	5-10	80-90		30-50	40-50
Ru	5-15		0-5	40-50		0-5	
Ir	20-30	0	0	40-50		5-10	
Os			<i>no relevant use end use sectors</i>				

# WEEE, Recycling & Bulk Metals

Pure material recycled under current policy (tonnes)

Material	C&D	ELV	Packaging	Battery	WEEE	Total
<b>Metal</b>	<b>9 989 944</b>	<b>4 294 855</b>	<b>3 600 212</b>	-	<b>1 169 576</b>	<b>19 054 587</b>
<b>Ferrous metals</b>	<b>9 989 944</b>	<b>3 842 765</b>	<b>2 788 713</b>	-	<b>1 063 251</b>	<b>17 684 673</b>
<b>Non ferrous</b>		<b>452 090</b>	<b>811 499</b>	-	<b>106 325</b>	<b>1 369 914</b>
<b>Aluminium</b>	-	-	<b>604 453</b>	-	-	<b>604 453</b>
<b>Glass</b>	-	-	11 233 183	-	-	<b>11 233 183</b>
<b>C&amp;D</b>	209 788 824	-		-	-	<b>209 788 824</b>
<b>Plastic</b>	4 994 972	-	4 838 694	-	531 626	<b>10 365 292</b>
<b>Paper</b>	-	-	30 509 027	-	-	<b>30 509 027</b>
<b>Wood</b>	9 989 944	-	5 323 356	-	-	<b>15 313 300</b>
<b>Total</b>	<b>234 763 684</b>	<b>4 294 855</b>	<b>55 504 472</b>	-	<b>1 701 202</b>	<b>296 264 213</b>

# Metal Recycling – Issues behind the Rates

- Recycling information problem
  - statistics for many metals missing
- Sometimes lower appropriate collection rate and treatment of modern appliances containing rarer metals
  - Low levels of ‘small’/IT’ WEEE collected
  - Hoarding, dispersed metal use & lack of recovery technology are major factors
  - Also leakage from system – inside and outside EU
- Example of WEEE
  - On tonnage basis, WEEE is a relatively lesser importance for ‘bulk’ metals (e.g. iron) than other streams – though still significant potential (e.g. copper)
  - However, major potential source of precious or rare metals (e.g. palladium; gallium etc)
  - Potential not yet realised
- Amongst other factors, overall result is low recycling rate for these metals



# Recommendations of WG Criticality

Two types of recommendations:

- follow-up and further support
  - policy-oriented recommendations
    - Covering amongst others:
      - Substitution
      - Material Efficiency
      - **Recycling**
- Report released in June 2010

# WG Criticality

## Recommendations ex. Recycling

- Mobilise EoL products with critical raw materials for proper collection
  - instead of stockpiling them in households (hibernating) or discarding them into landfill or incineration;.
- Improve overall organisation, logistics and efficiency of recycling chains
  - by focusing on interfaces and system approach;
- Prevent illegal exports of EoL products containing critical raw materials and increasing transparency in flow
- Promote research on system optimisation and recycling of technically- challenging products and substances



# Workshop on Secondary Metals

April 2010

- Day conference co-organised with metals industry
- Across-the-board agreement on importance of secondary raw materials for EU needs
- Focused on four areas for improvement:
  - Enforcement of trade related legislation including WSR
  - Level playing field in treatment of secondary raw materials
  - Improved management of secondary raw materials
  - Economic viability of Recycling
- Full industry proposals in Ökoinstitut paper published in June 2010

# Second RMI Communication

- Adopted February 2011
- Commission proposed actions in the area of non-energy, non-agricultural raw materials
- It further pursues and reinforces the 3 pillar-based approach of the Raw Materials Initiative



# Critical raw materials

- **Monitor** issues of critical raw materials to identify priority actions
- **Update** list of critical raw materials at least every 3 years
- Policy actions not limited to critical raw materials exclusively

# RMI & Promotion of Recycling (1)

- Recycling key part of RMI – second communication adoption in early February
  - Mid-2010 consultation further confirmed importance of recycling
- Huge potential of EU's 'Urban Mines' but need **level playing field** for EU recyclers
- Have clearer definition of **when waste becomes product**
  - New EoW criteria developed (steel, aluminium, copper (soon))
- Have new rules proposed for **export/collection of WEEE**
  - Extend these export rules to other streams?
- Need to further implement existing **waste shipment rules** – how could this be done?
  - through better inspection standards for waste?
  - via promote research on technologies for detection illegal shipments?
  - by re-enforced co-operation between waste enforcers?
  - through clearer guidance for ESM treatment?



# RMI & Promotion of Recycling (2)

- Need to tackle obstacles to the **functioning of the recycling market** – How?
  - look at which collection and treatment schemes work best/where (best practices)
  - how can the use of secondary raw materials in products be promoted (eco-design Directive up for review in 2012)
- Need for **more innovation on recycling**, as well as on extraction, processing, use, substitution etc
- Other:
  - Improvement in recycling statistics, but what?
  - Need to assess possibility of assessing how certain aspects of waste legislation could be aligned to improve coherence



# Potential Innovation Partnership on raw materials

- Need for innovation along the entire **value chain** of raw materials
- Commission preparing a **proposal** for an Innovation Partnership on raw materials within the Europe 2020 Innovation Union Flagship
- Stakeholder meeting on 28 February & Public **consultation** held from April till June
- Working towards proposal in late 2011
- Two out of five WPs concern recycling (one concerns substitution)
- Two studies starting – one on pilot plants and another on material flows

# Views of other institutions on RMI

- Council supports proposed approach in its Conclusions of 10 March 2011
- EP is adopting an own-initiative report on (due today) which expresses support and provides further political guidance

# Resource Efficiency Flagship

- Many of these issues also to be dealt with in parallel work on Resource Efficiency (part of EU2020 strategy)
- Chapeau **Communication on Resource efficiency** adopted in January
- More detailed **Roadmap** to a Resource Efficient Europe due for adoption on 20 September
  - Will deal with a number of issues including ‘waste as a resource’
- The roadmap will set out specific resource efficiency objectives, and how to meet them, based on actions up to 2020 with a time perspective of up to 2050



**Thank you for your attention !**

