

Trois cas d'étude

Plafonnement de la production pétrolière : hypothèses et implications

Jean-Charles Hourcade

Déploiement des énergies renouvelables en Europe : place de la France, question des pays intensifs en carbone

Nadia Maïzi

Chine : adhésion à une politique carbone à quelles conditions ?

Jean Charles Hourcade et Nadia Maïzi



Déploiement des énergies renouvelables en Europe : place de la France, question des pays intensifs en carbone

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Chaire Modélisation prospective
au service du développement durable



TIMES model for RES2020

Renewable Energy Sources

Analysing the paths for achieving the
Renewable Energy Targets for 2020

using the TIMES modelling platform:

TIMES Pan European Model

for EU-27, Iceland, Norway, Switzerland



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	Reference	RES Ref	RES Transfer	RES 30
RES policies or targets	Existing ones in countries (feed-in tariffs, etc.) The total amount of the incentives (€) in 2020 are limited to 3 times the 2005 amount.	As in BaU more the Directive 12/2008: - <i>RES final energy</i> 20% by 2020 and trajectory towards 2020 - <i>RES transport</i> 5.75% by 2010 and 10% by 2020	As in RES Ref	As in RES Ref
EU Climate policy targets	No quantity limits but CO2 tax in ETS: from 20€ in 2010 to 24€/tCO2 in 2030	Directive proposal: 20% reduction by 2020 from 1990 (max 3.6 GtCO2 in 2020)	As in RES Ref	30% reduction by 2020
MS Allocation	None	Non ETS emissions Directive proposal (<i>country X</i> = -X%, corresponding to a max of <i>XXX</i> MtCO2 in 2020)	As in RES Ref	As in RES Ref
Virtual trade in RES	Not allowed	Not allowed	Allowed	Not allowed
Fossil prices	According to WEO2008 (IEA)			
Other assumptions	Consistent with PRIMES baseline as far as underlying PRIMES data are available			

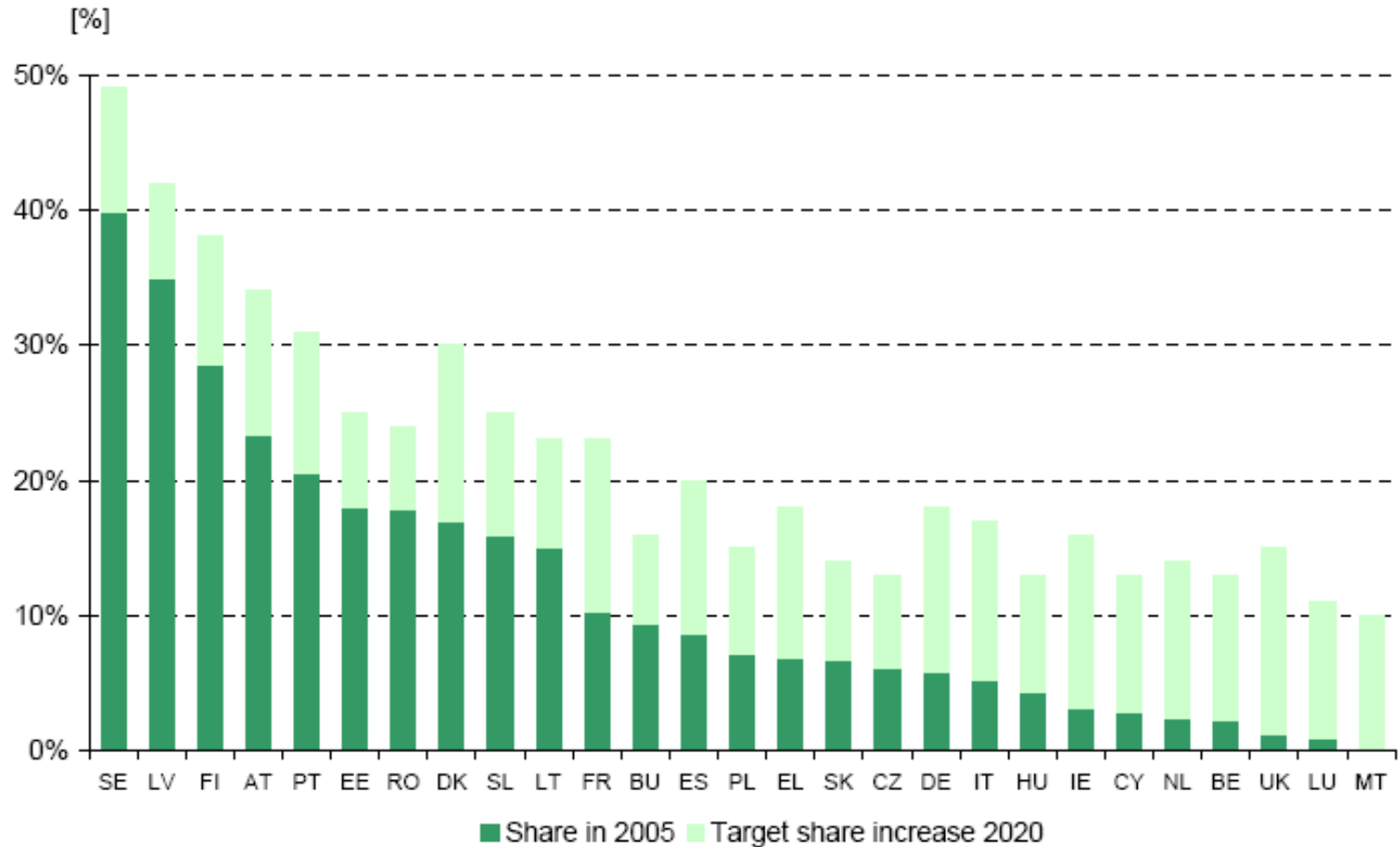


- 1. Reference Scenario (BaU):** policies currently in practice
- 2. RES Reference Scenario (RES):**
20% target for RES (country level) and 20 % GHG mitigation EU level (CO2 reduction 18% compared to 1990 level).
- 3. RES Transfer Scenario (RES-T):**
trade of (renewable) electricity and bio-fuels, a virtual trade mechanism in RES production rights is in place.
- 4. RES 30 Scenario (RES-30):** 30 % GHG mitigation

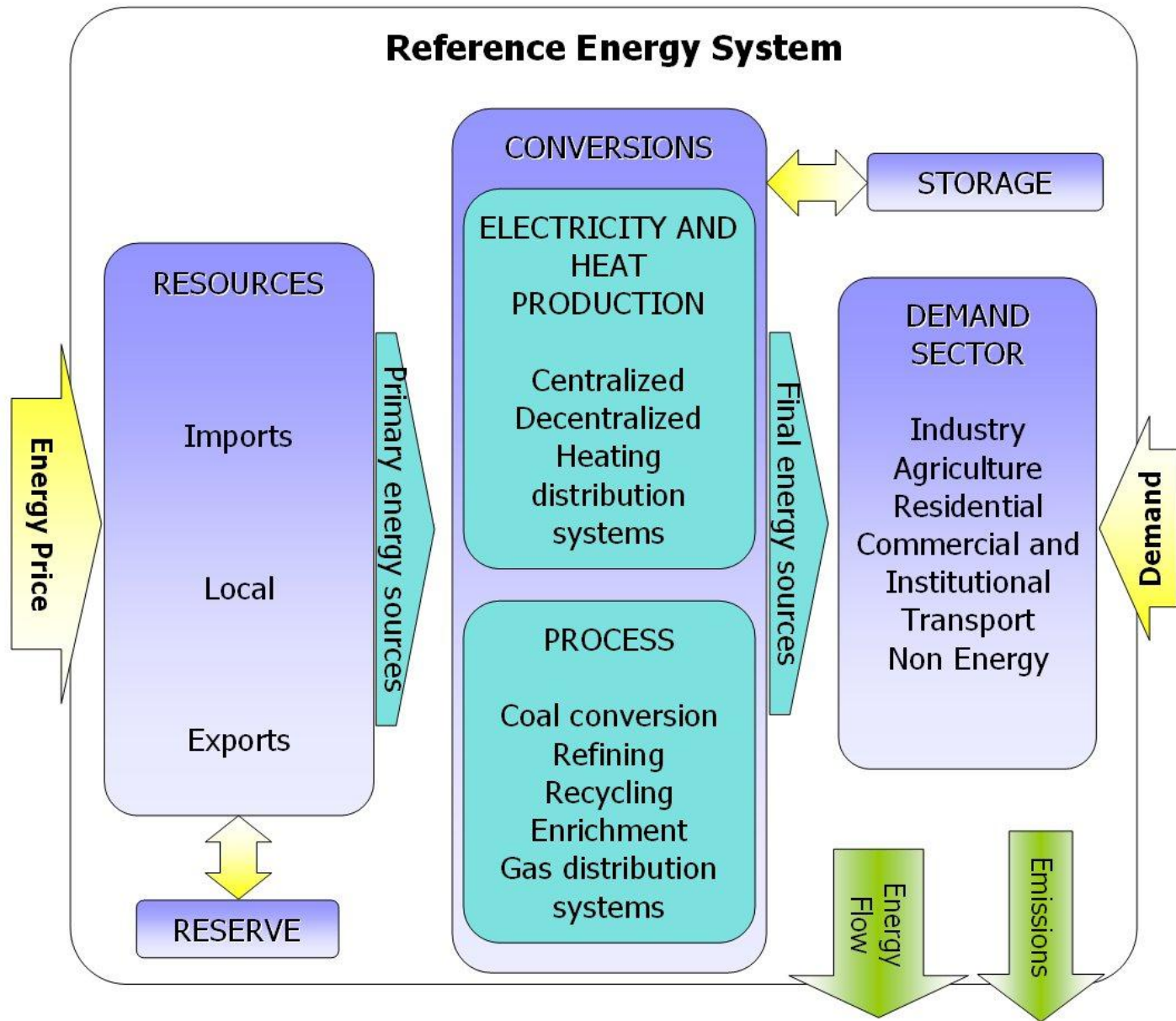


Allocation of the 20% renewable energy target

EU Energy and Climate packages of January 2008



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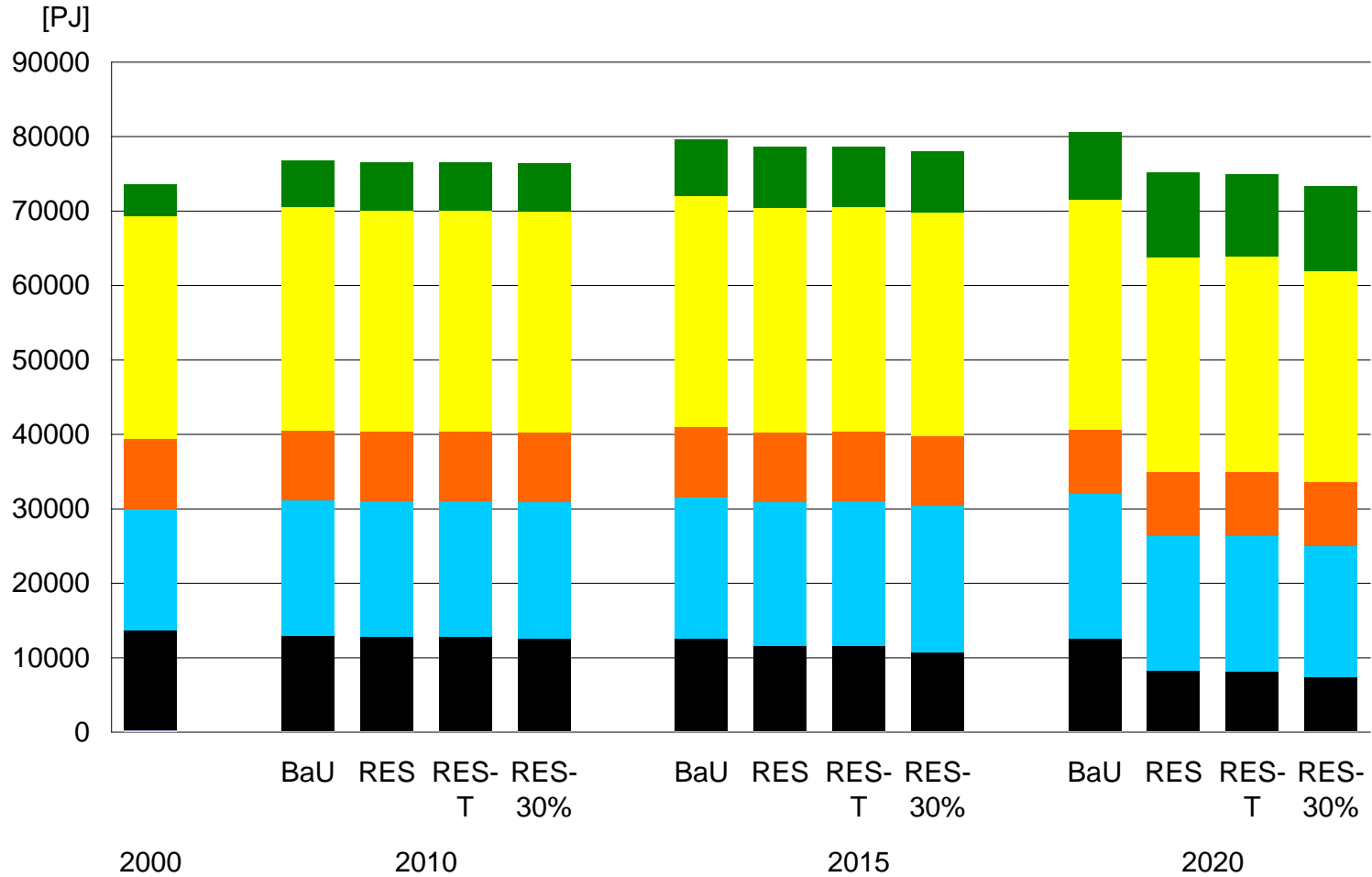


Three keypoints

- Renewable Energy Technology Deployment – Scenarios results
- Transport fuels
- Trade and Import dependency



Primary energy supply

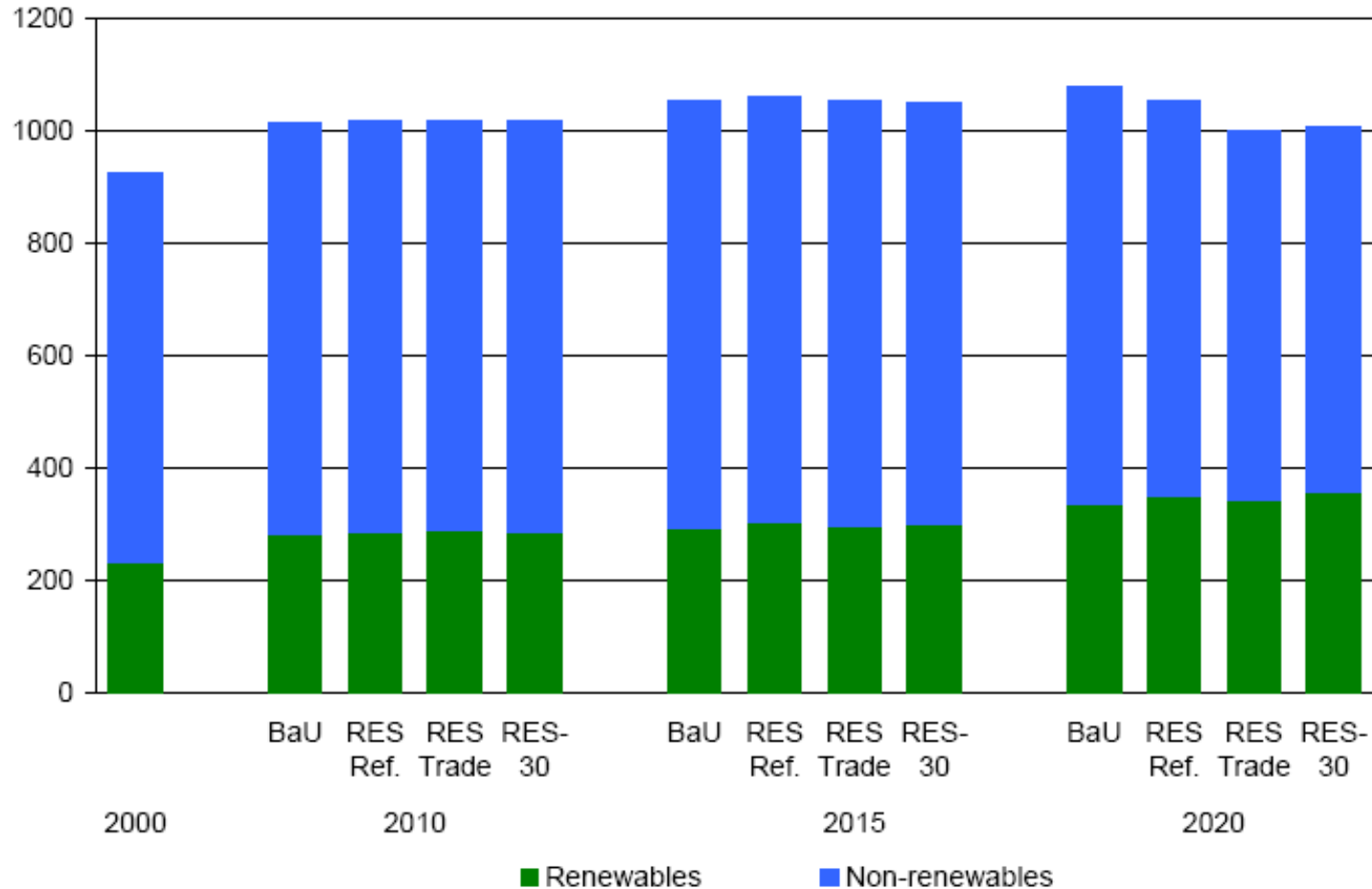


Electricity import Coal Gas Nuclear Oil Renewable

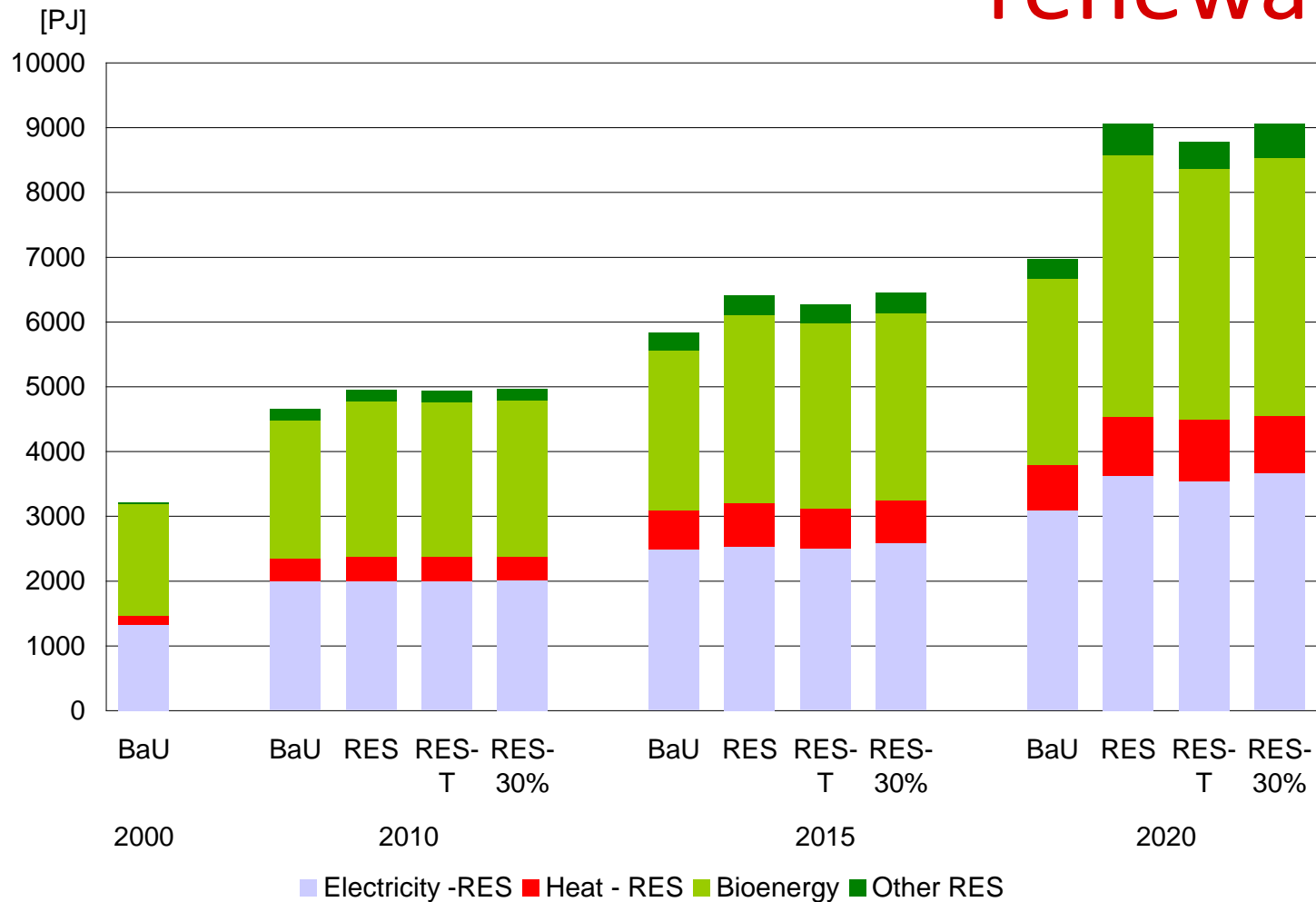


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Final energy use

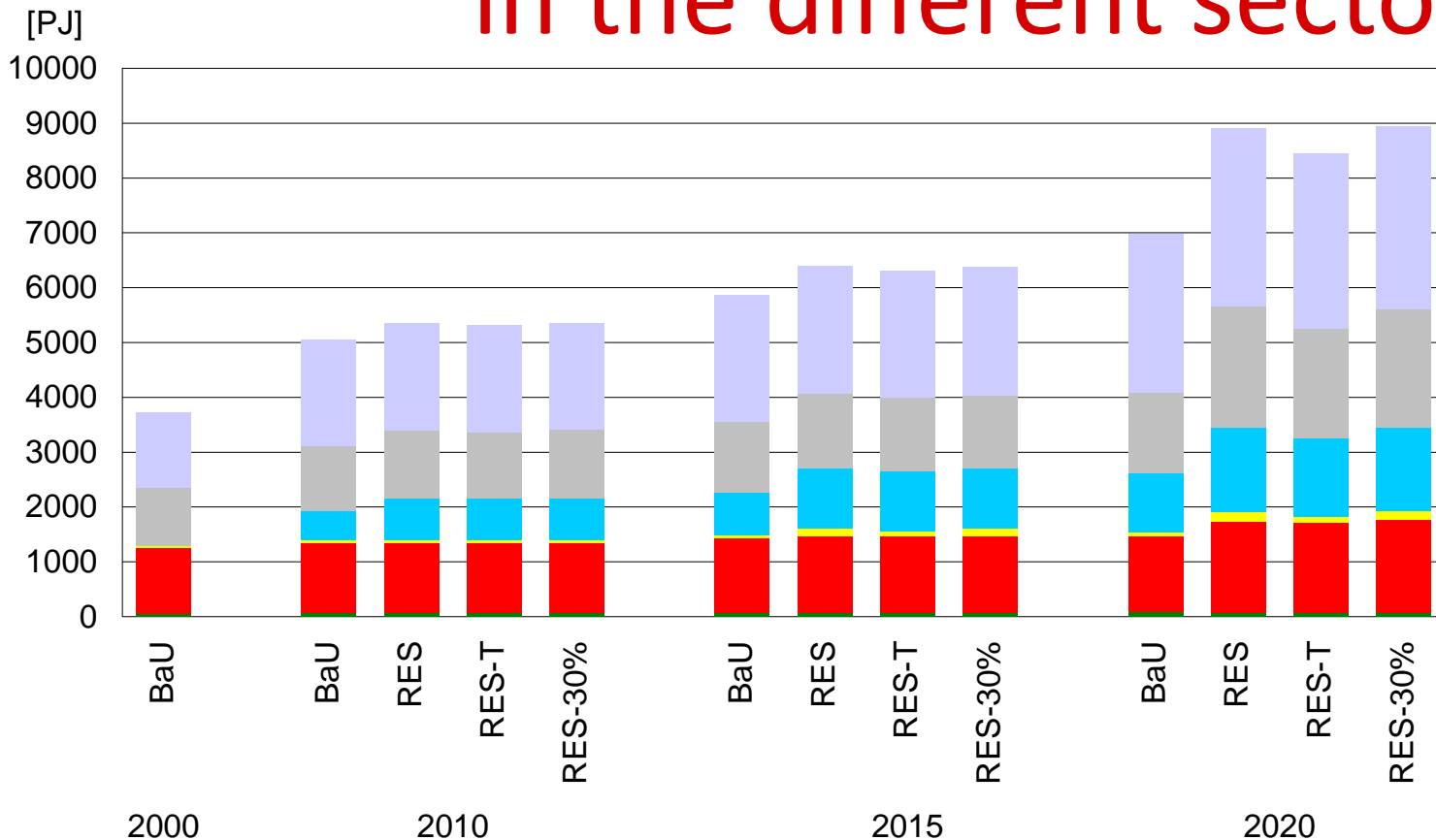


Final energy use of renewables



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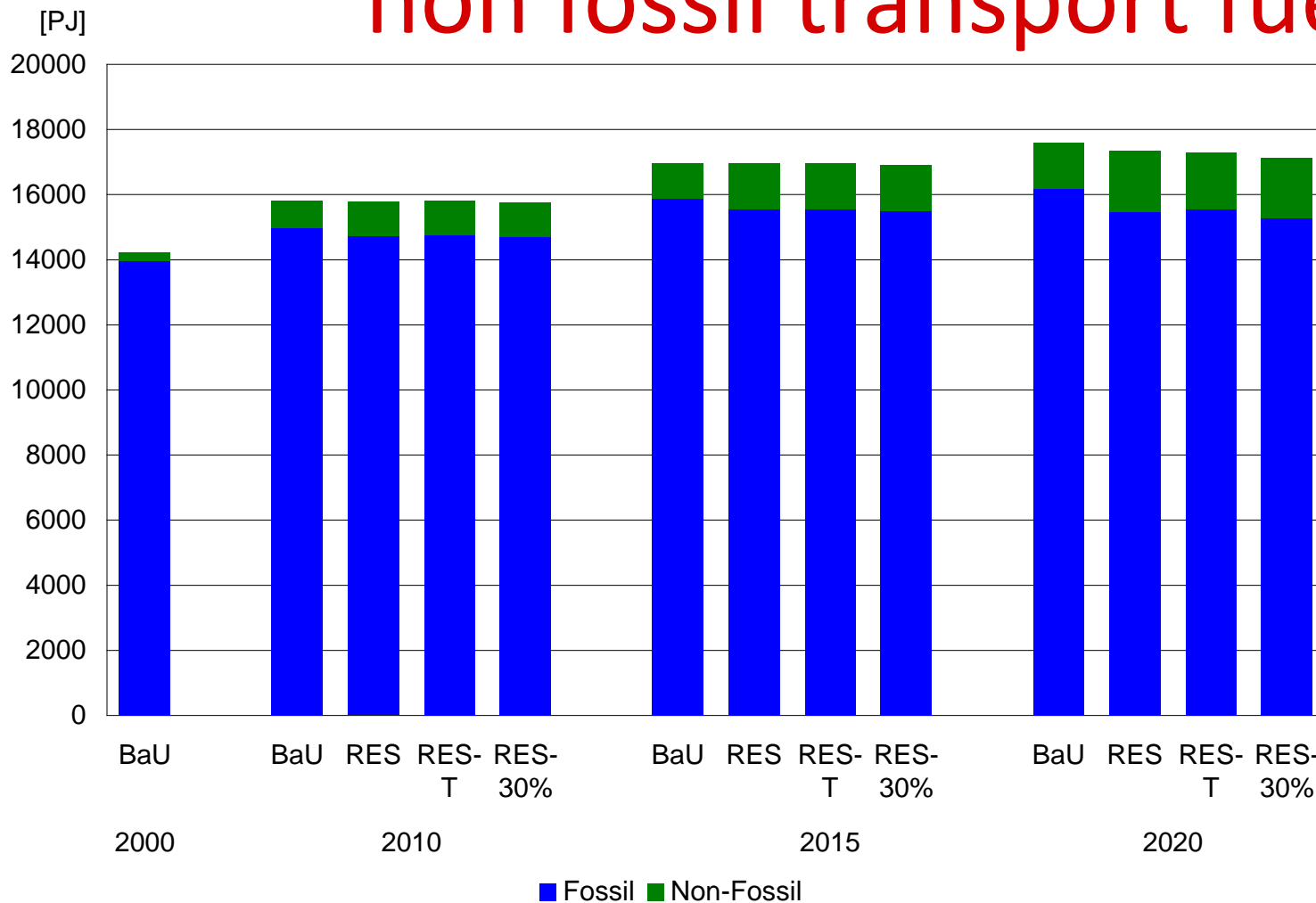
Direct use of RES in the different sectors



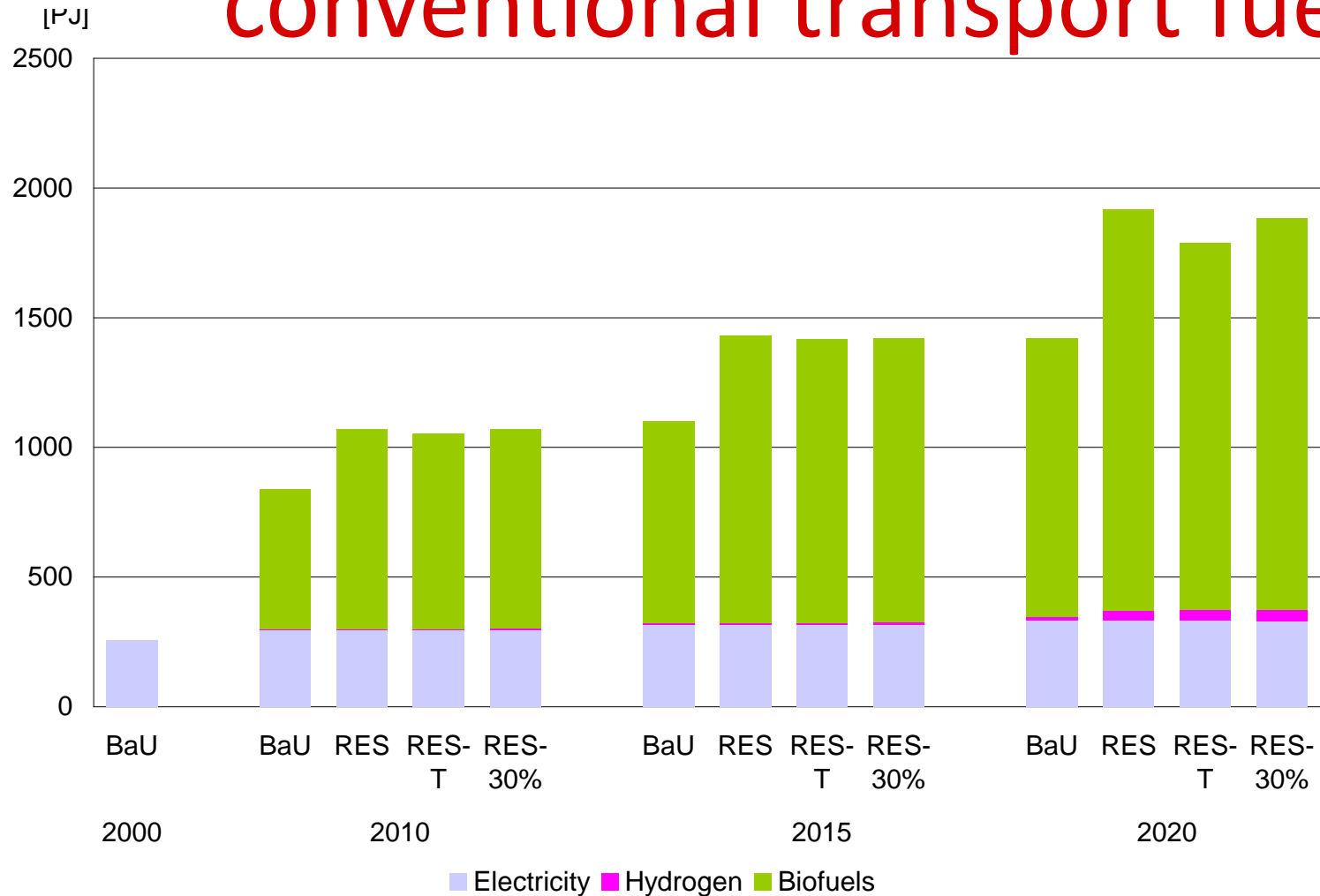
■ Agriculture
 ■ Residential
 ■ Commercial
 ■ Transport
 ■ Industry
 ■ Central heat & power



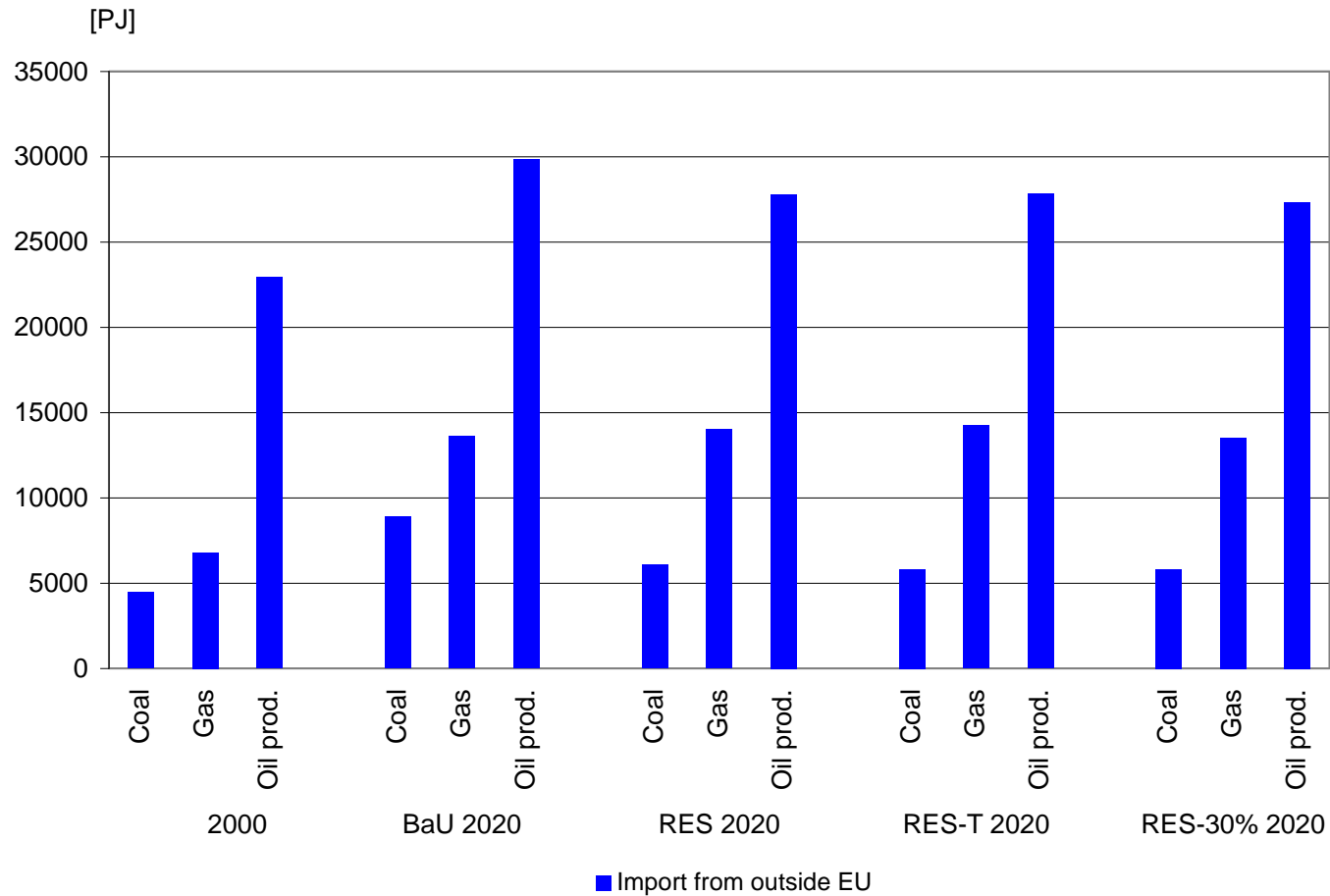
Final energy use fossil and non fossil transport fuels



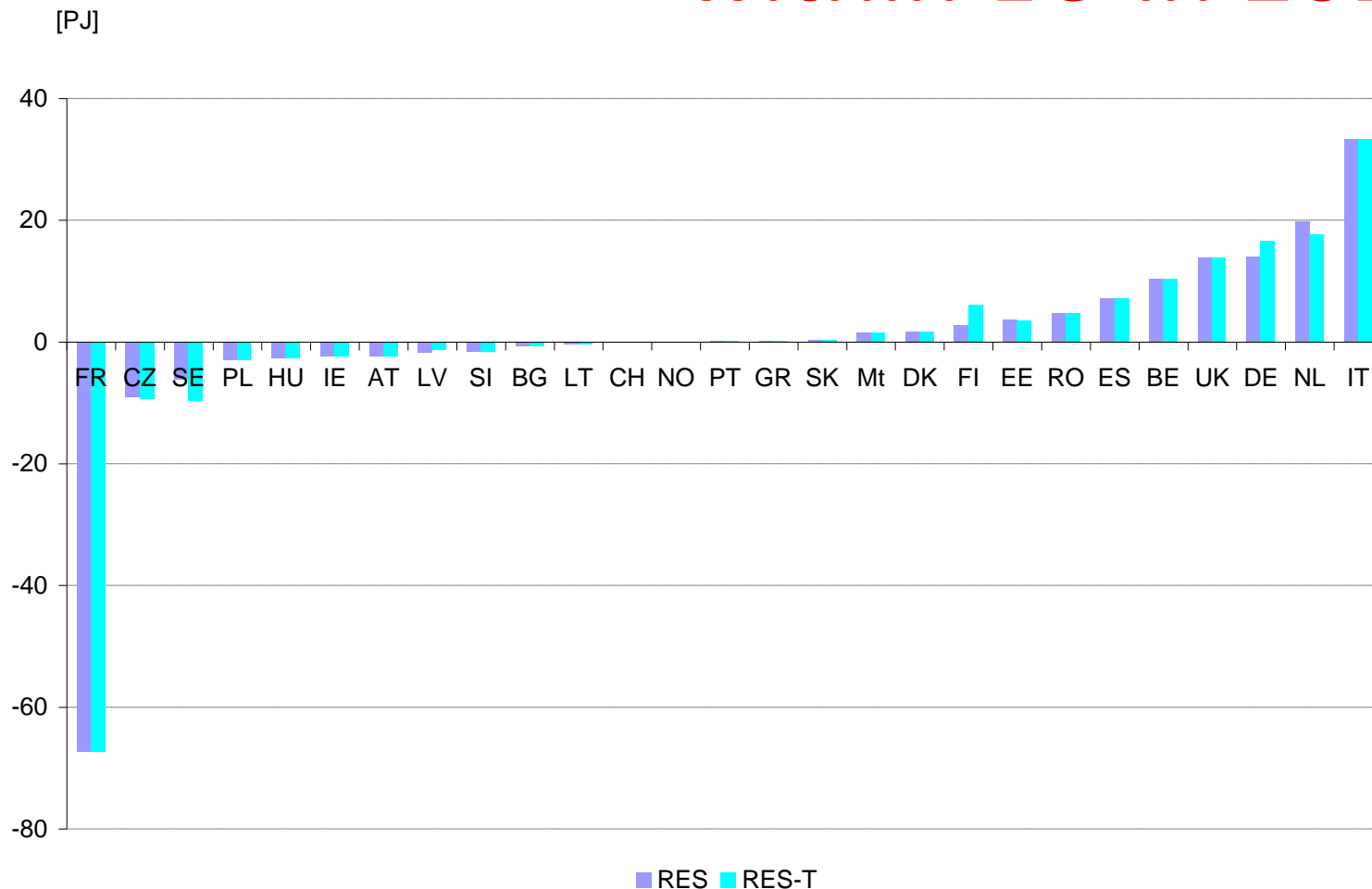
Development of non conventional transport fuel



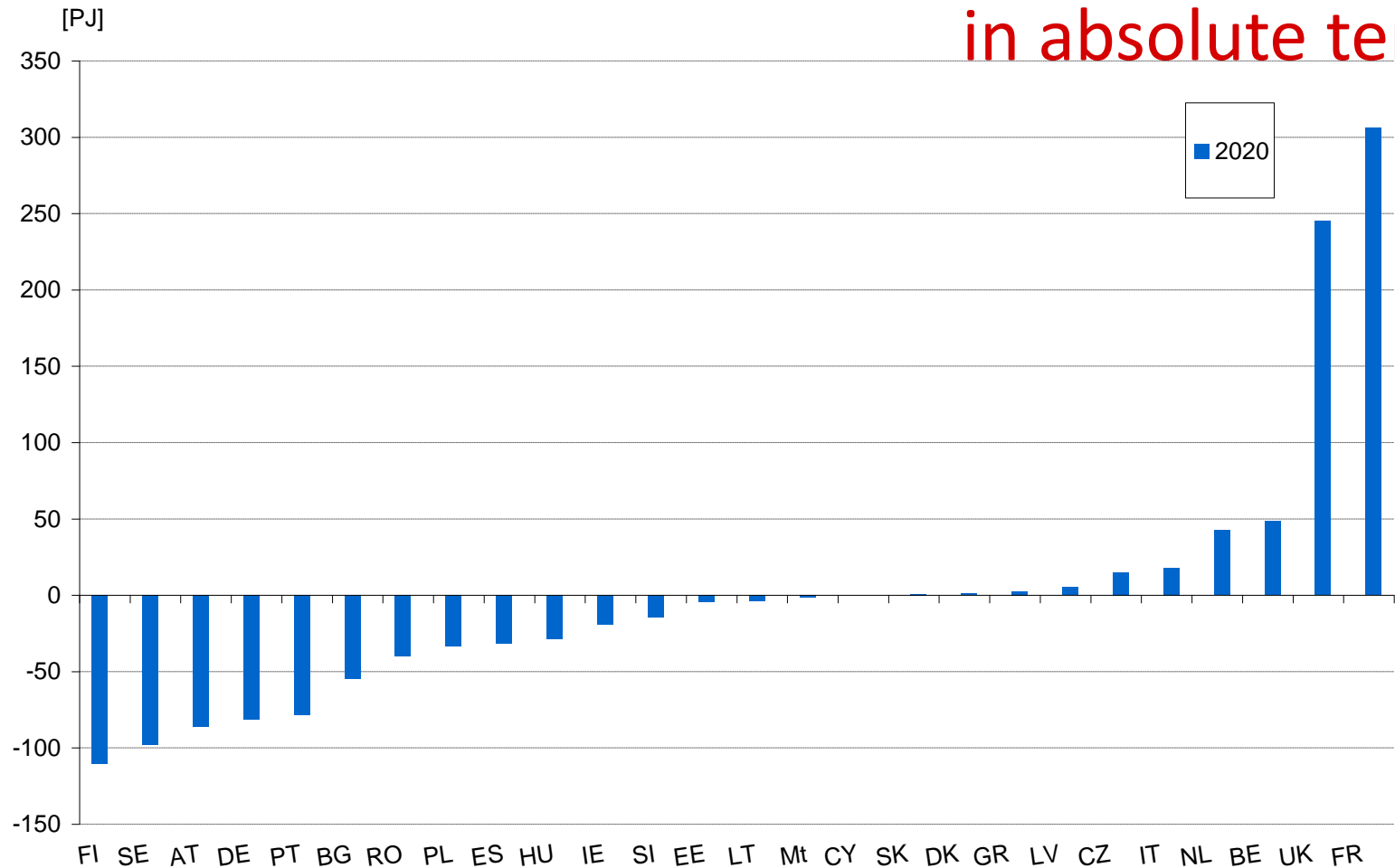
Net import of fossil energy carriers



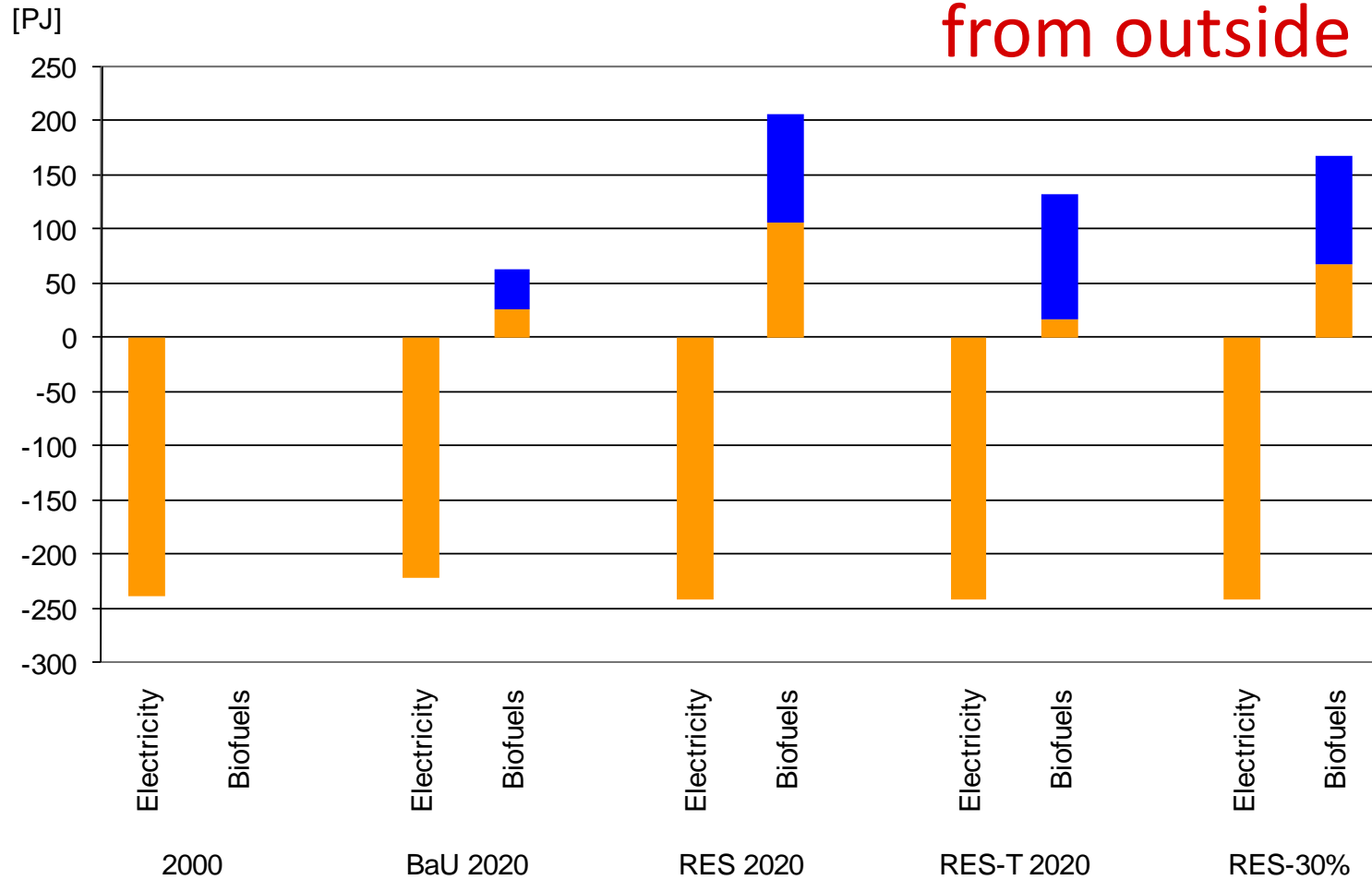
Real electricity trade within EU in 2020



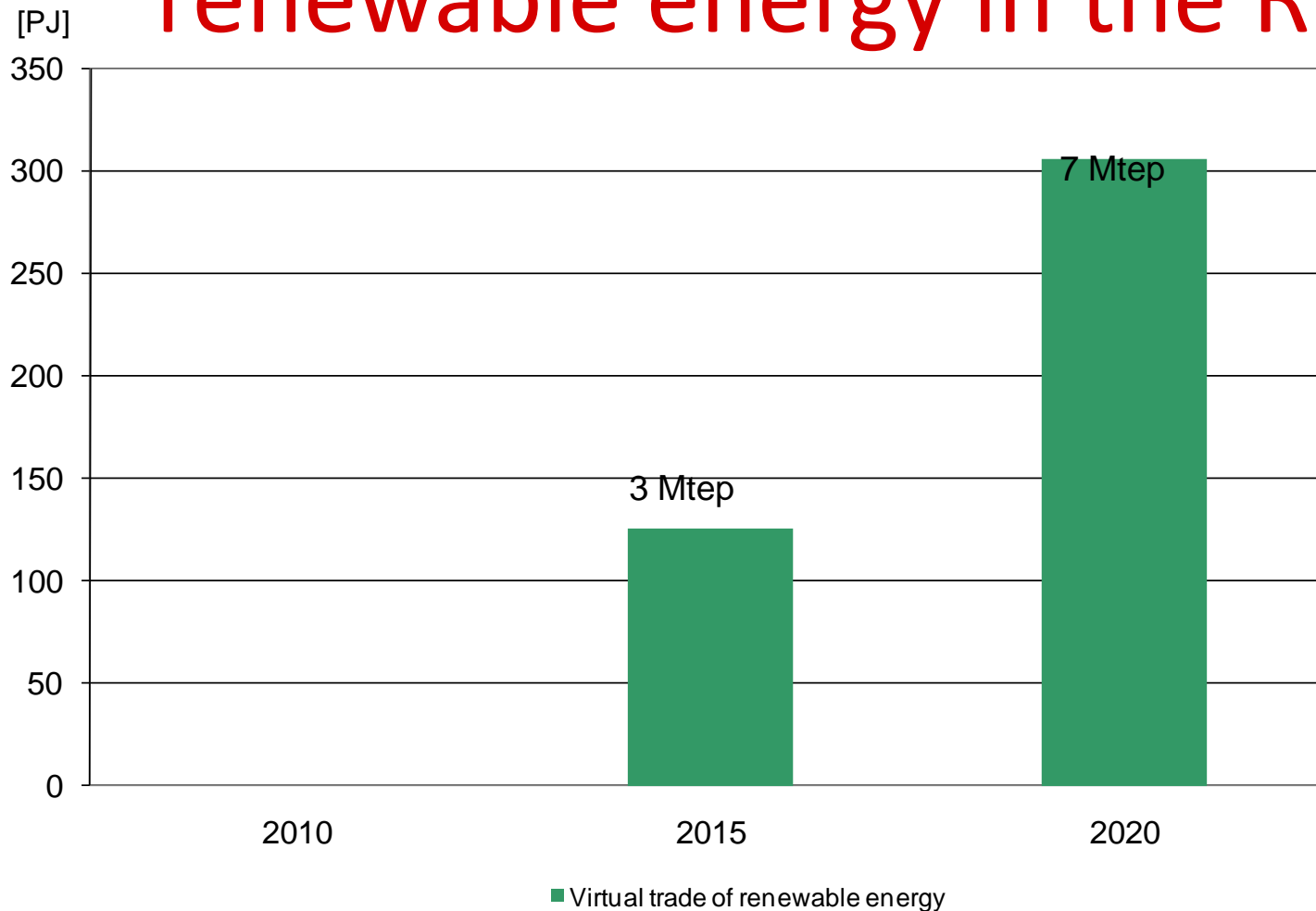
Virtual trade of renewable energy in the RES-T scenario in absolute terms



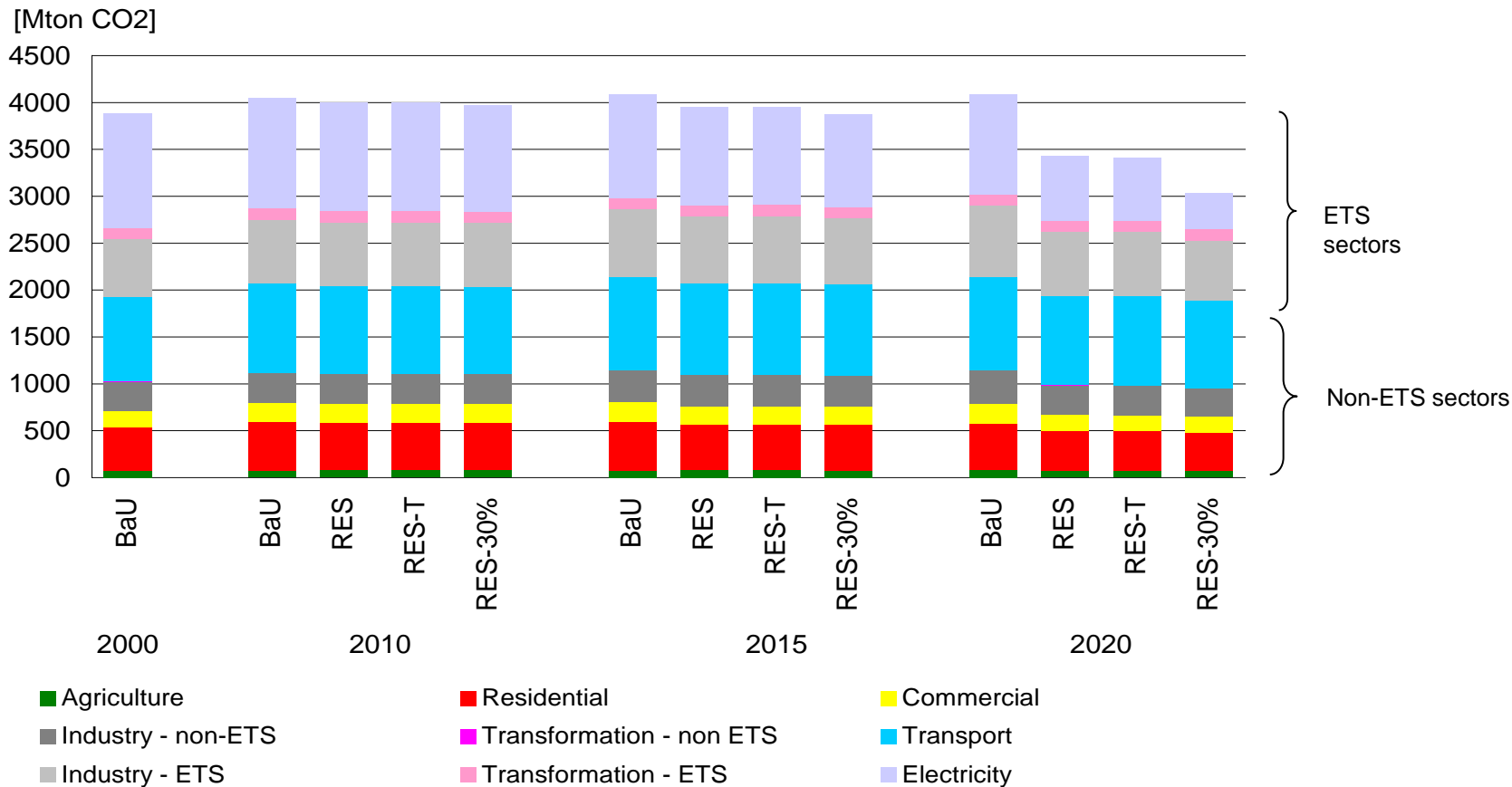
RES FRANCE: trade and import of biofuels and electricity from outside EU27



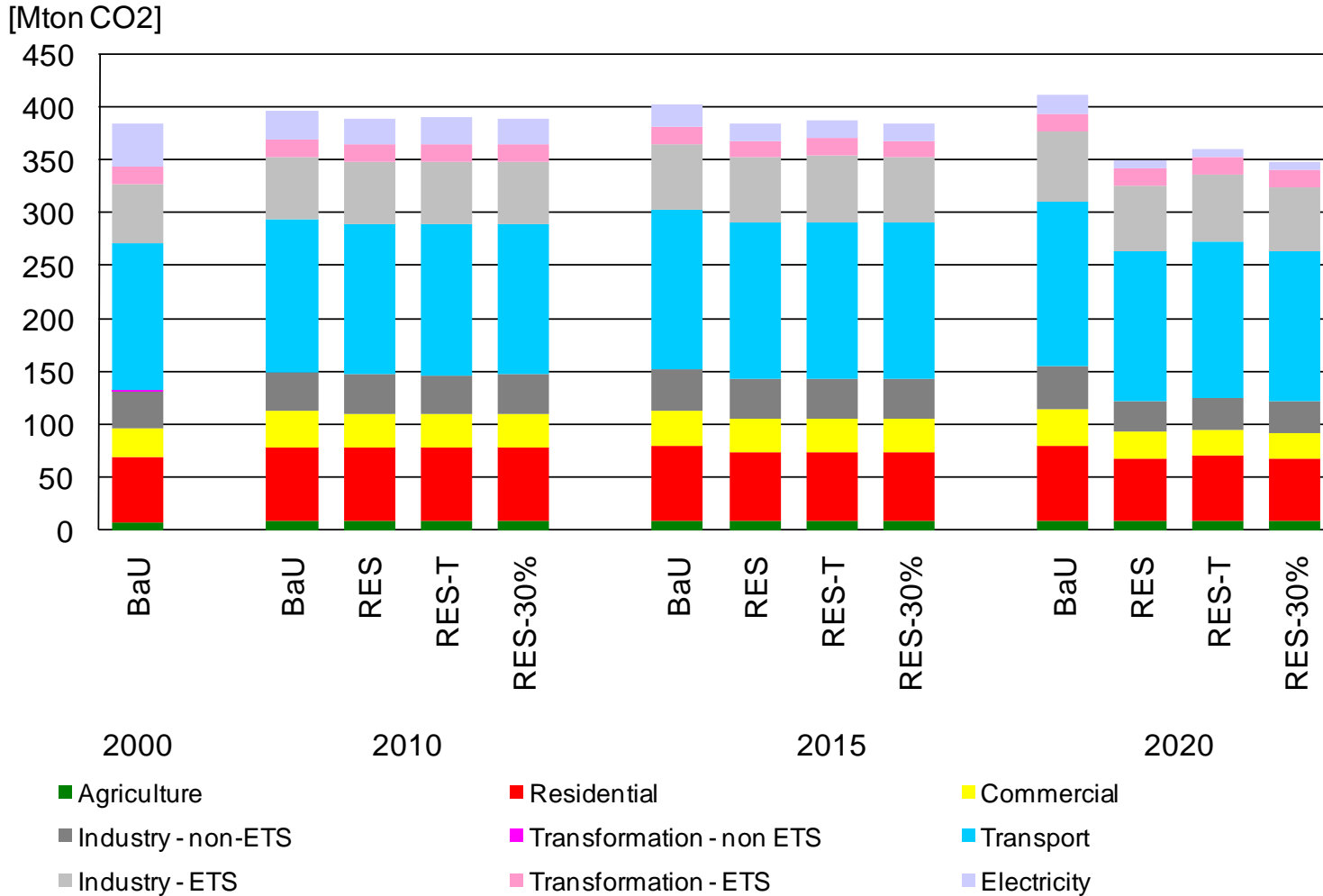
FRANCE: Virtual trade of renewable energy in the RES T



Impacts of policies on CO2 emissions



FRANCE : CO2 emissions



More renewables, less CO₂: what about the costs

compared to BaU

- Total discounted system costs increase
 - RES : + 0,22%
 - RES-T : + 0,18%
 - RES-30 : + 0,49% discounted costs are more than doubled compared with the scenario RES
- the annual costs related to renewable technologie
 - RES : + 40%
 - RES-T : + 30%
 - RES-30 : + 50% (CCS costs)

