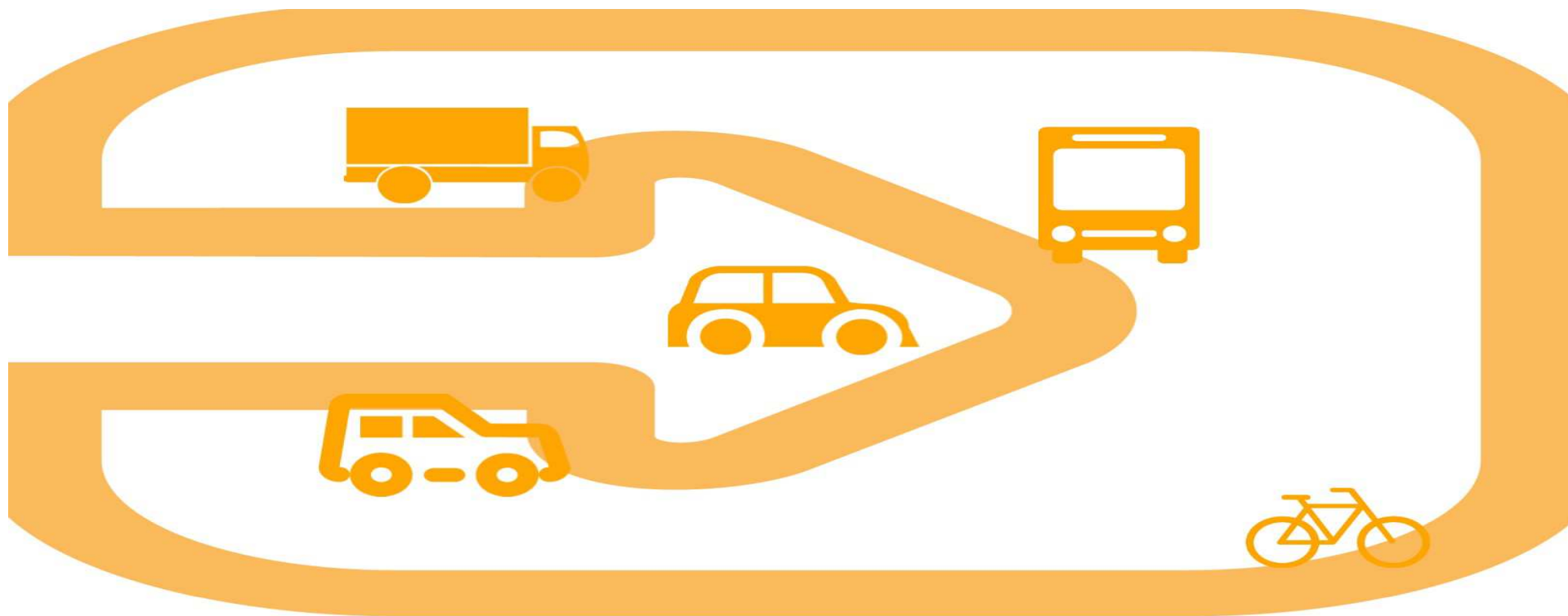


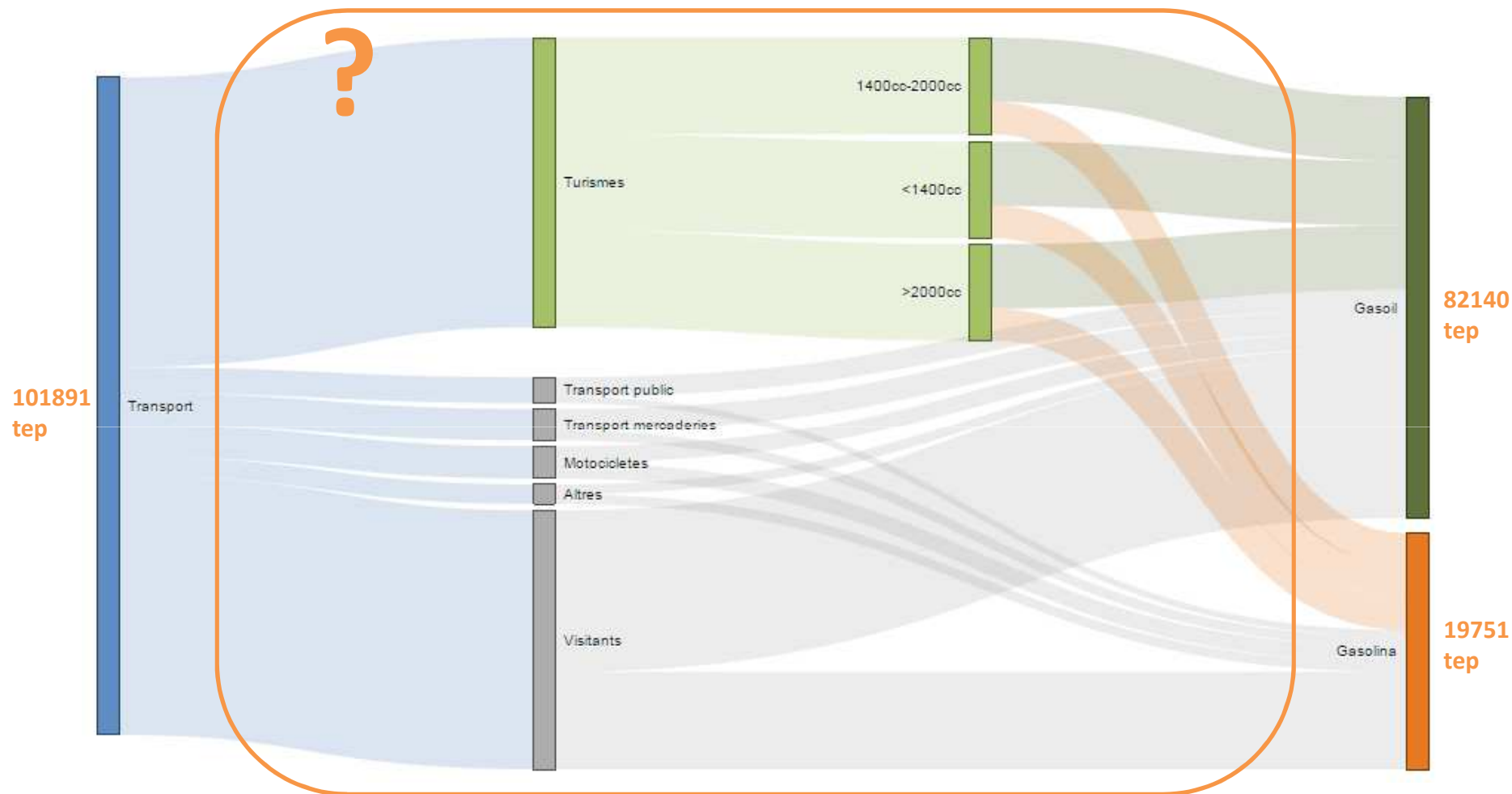


Una visió energètica del sector del transport a Andorra: present i futur

Transport i energia: context actual

- **Major consumidor d'energia** del país l'any 2013 (50% de l'energia final)
- Principal responsable de l'alta **dependència energètica** d'Andorra
- El **cost de les importacions** de carburants de locomoció és >100 M€/any
- Major contribuïdor a les **emissions de CO₂** l'any 2013 (**60% - IPCC Tier 1**)

Modelització energètica del sector del transport

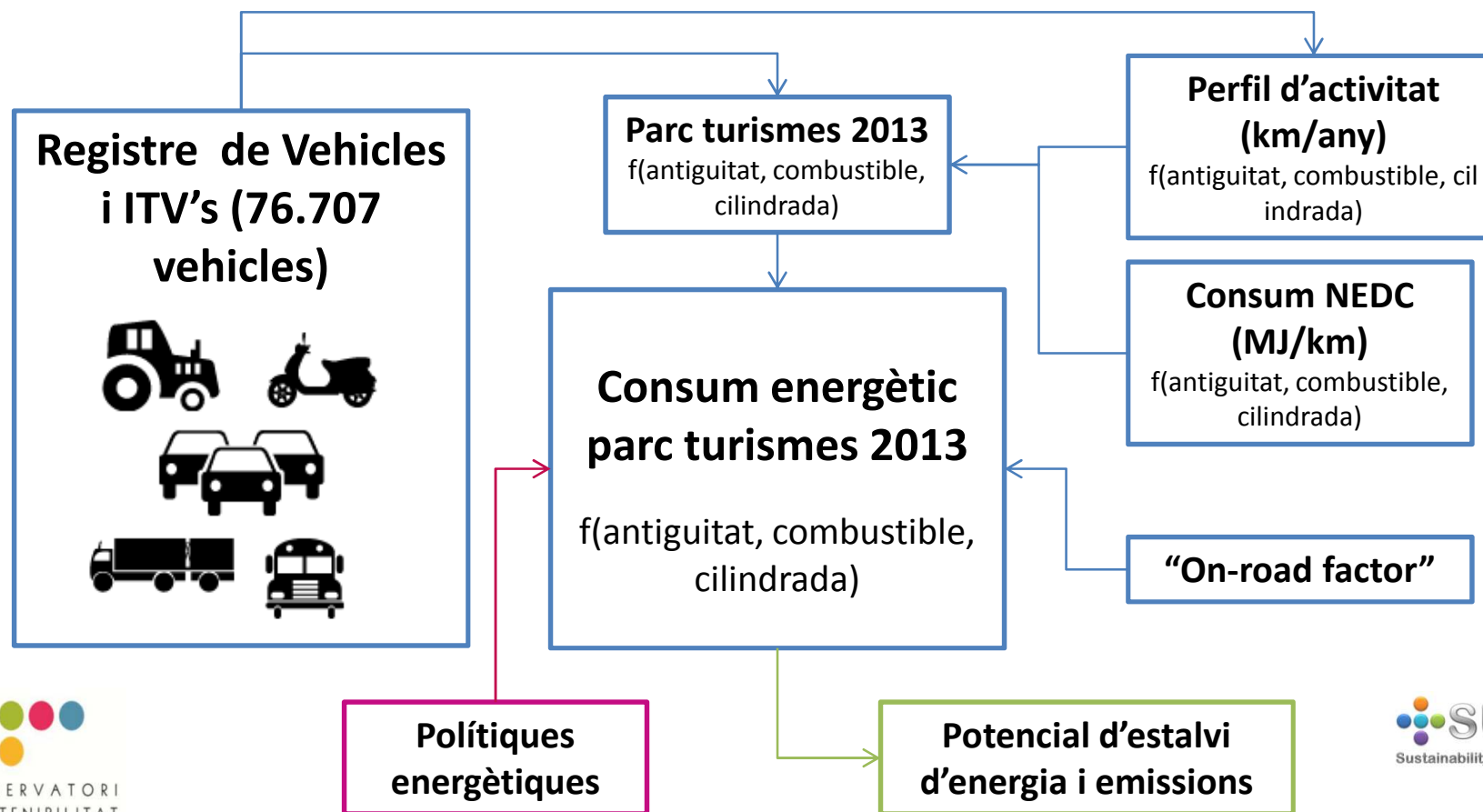


- Conèixer els factors influents en el consum
- Estimar-ne l'evolució futura
- Avaluar l'impacte de possibles canvis
- Potencial de polítiques energètiques

Model d'estoc del parc de turismes (I)

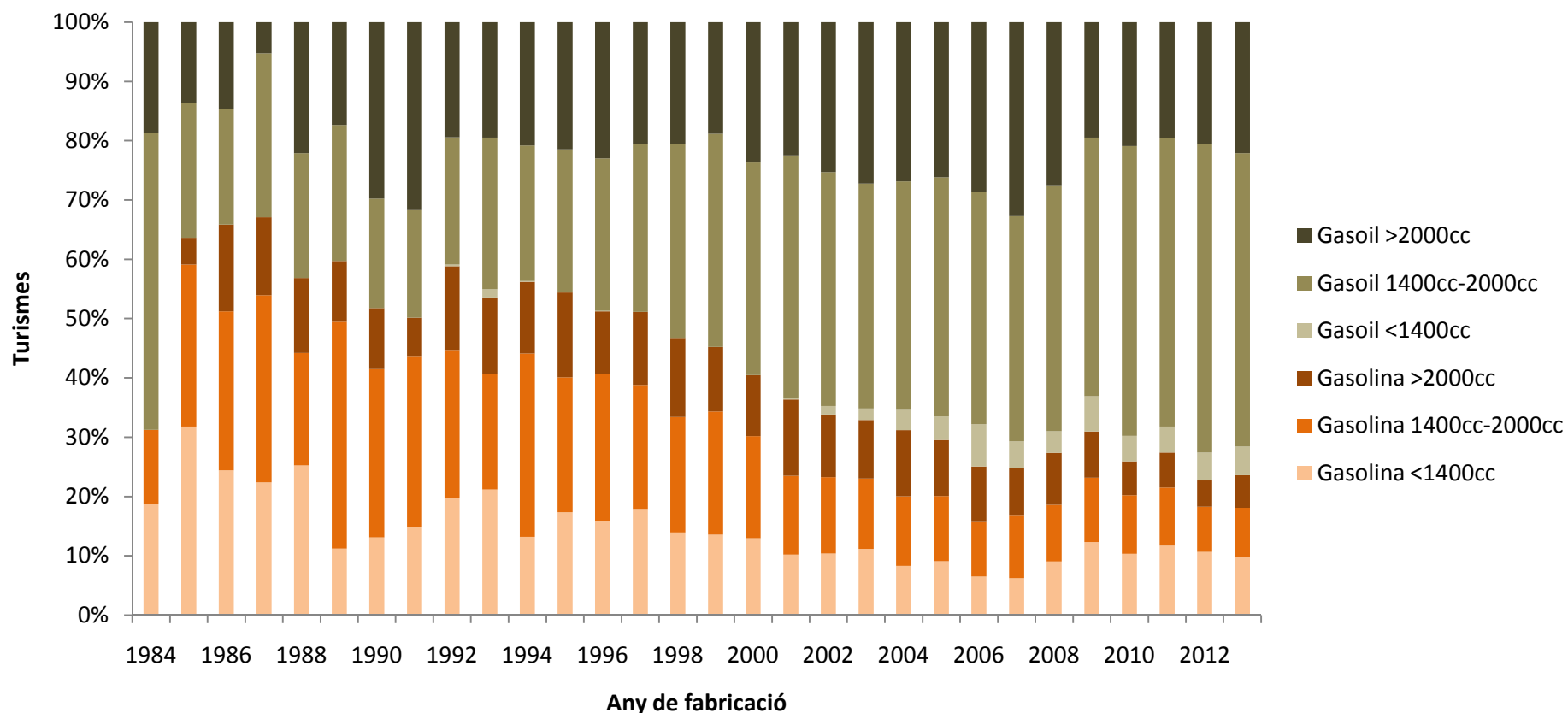
- **Metodologia**

- Technological car stock model (Daly et al. 2011)



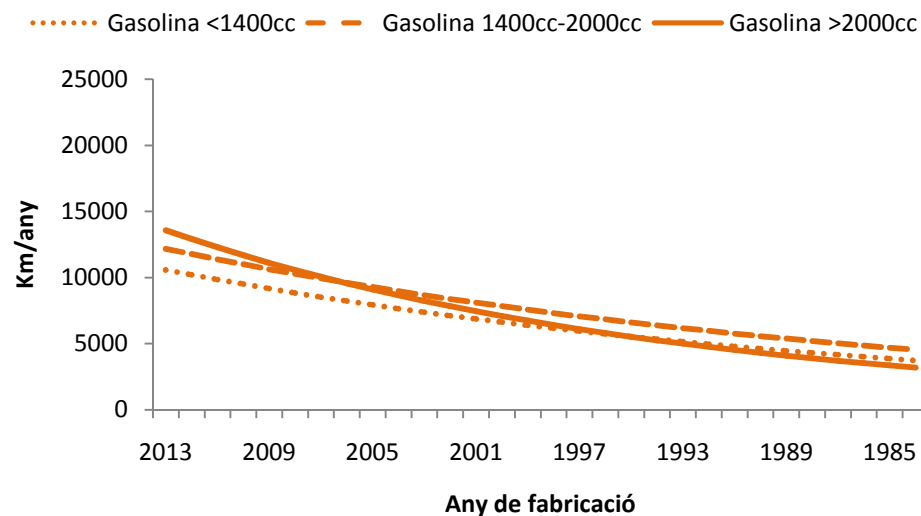
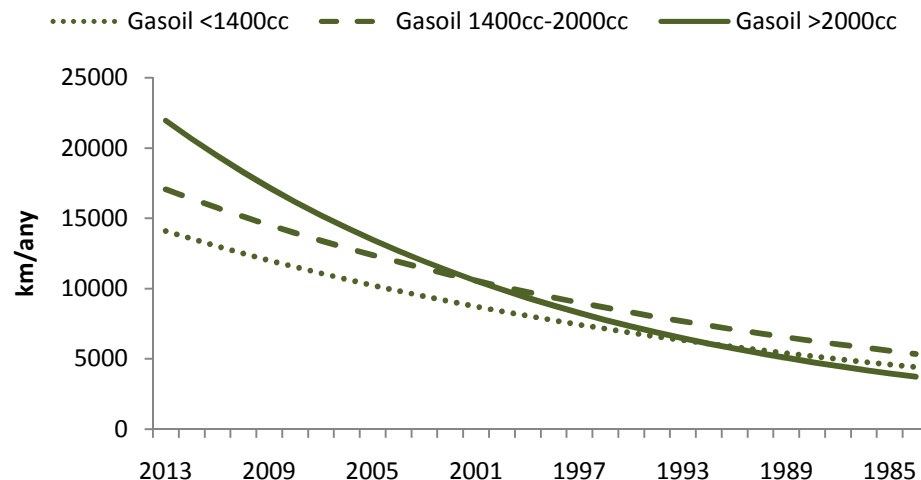
Model d'estoc del parc de turismes (II)

• Estoc de turismes 2013

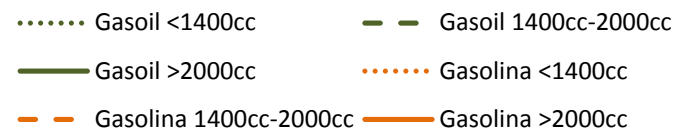
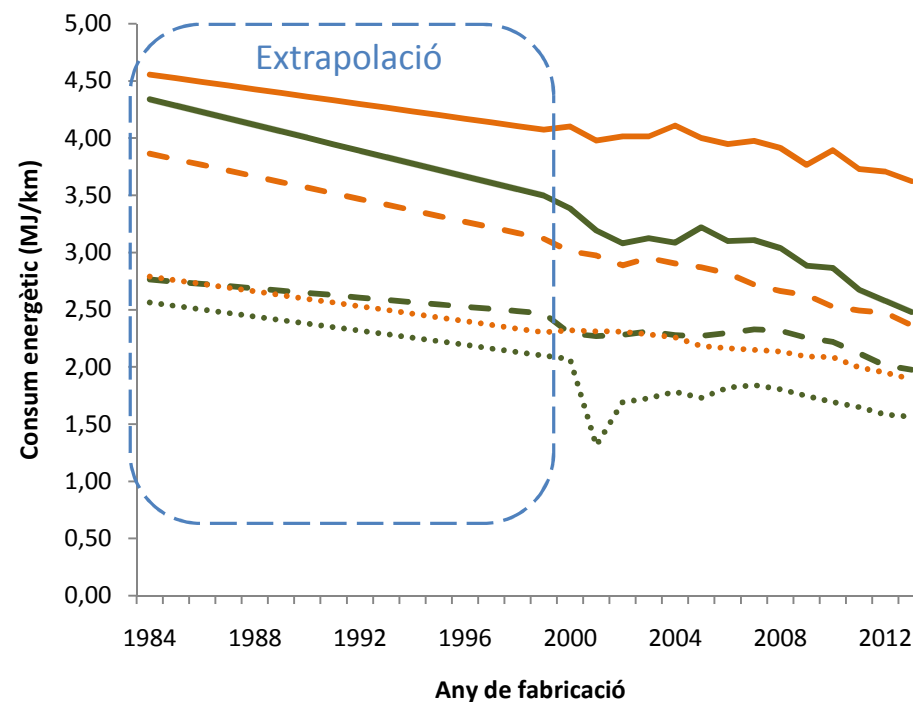
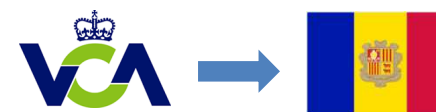


Model d'estoc del parc de turismes (III)

• Perfil d'activitat



• Consum NEDC



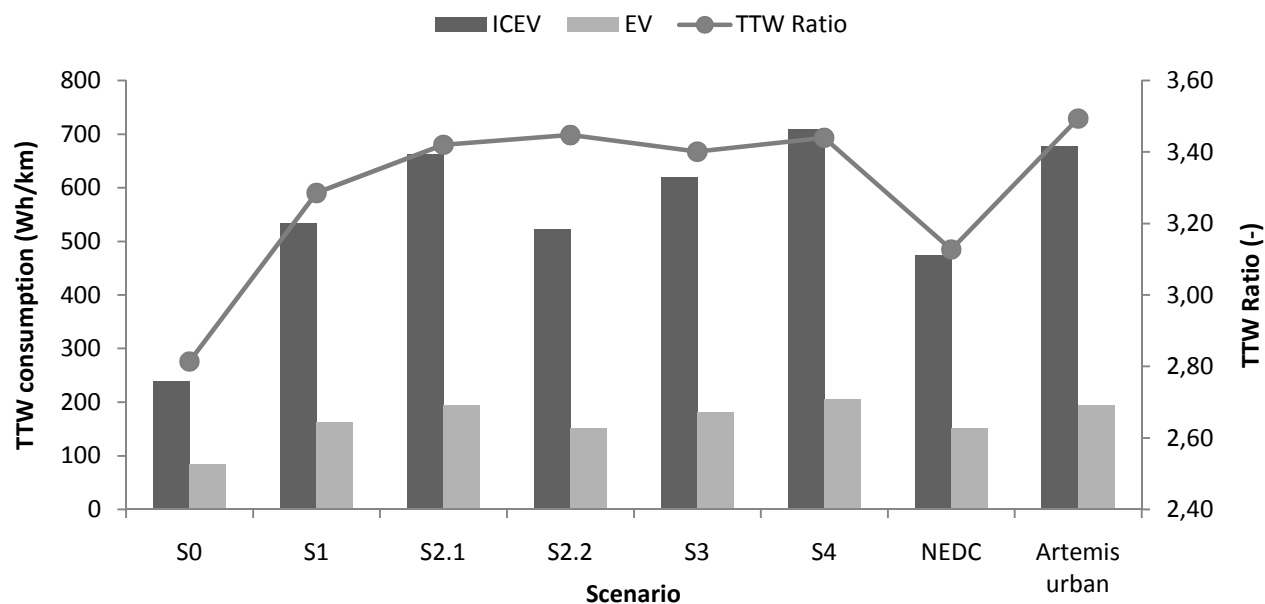
Model d'estoc del parc de turismes (IV)

- Consum energètic dels turismes en zones de muntanya

— Travesset-Baro et al. *Transportation Research Part D (2014)*. doi: 10.1016/j.trd.2014.09.006

Scenario	Orography	Road speed limit	Traffic controls	Driving style
S0				Constant speed
S1	X			Constant speed
S2.1	X	X	X	Normal
S2.2	X	Half of maximum	X	Normal
S3	X	X	X	Calm
S4	X	X	X	Aggressive

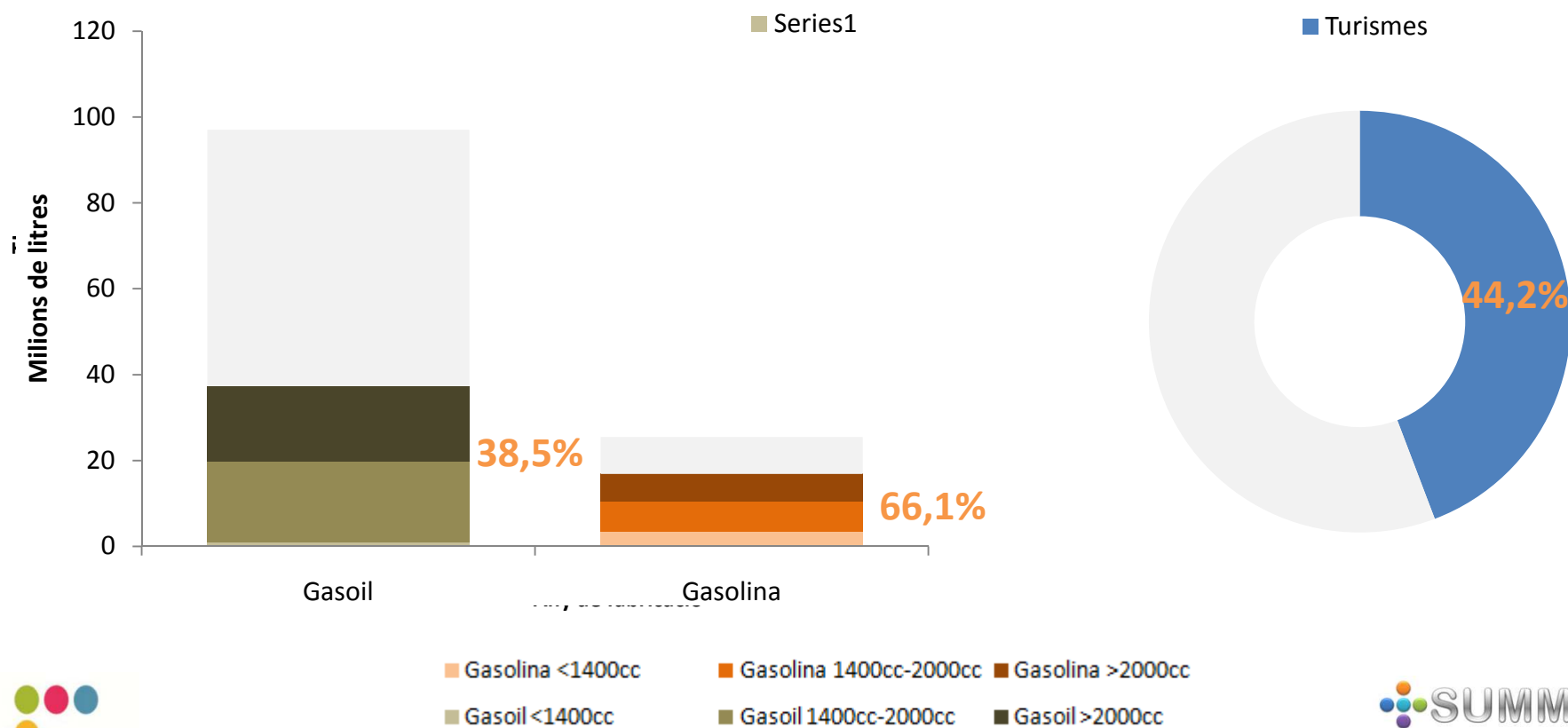
Resum dels escenaris considerats



“On-road factor” = 39,6%

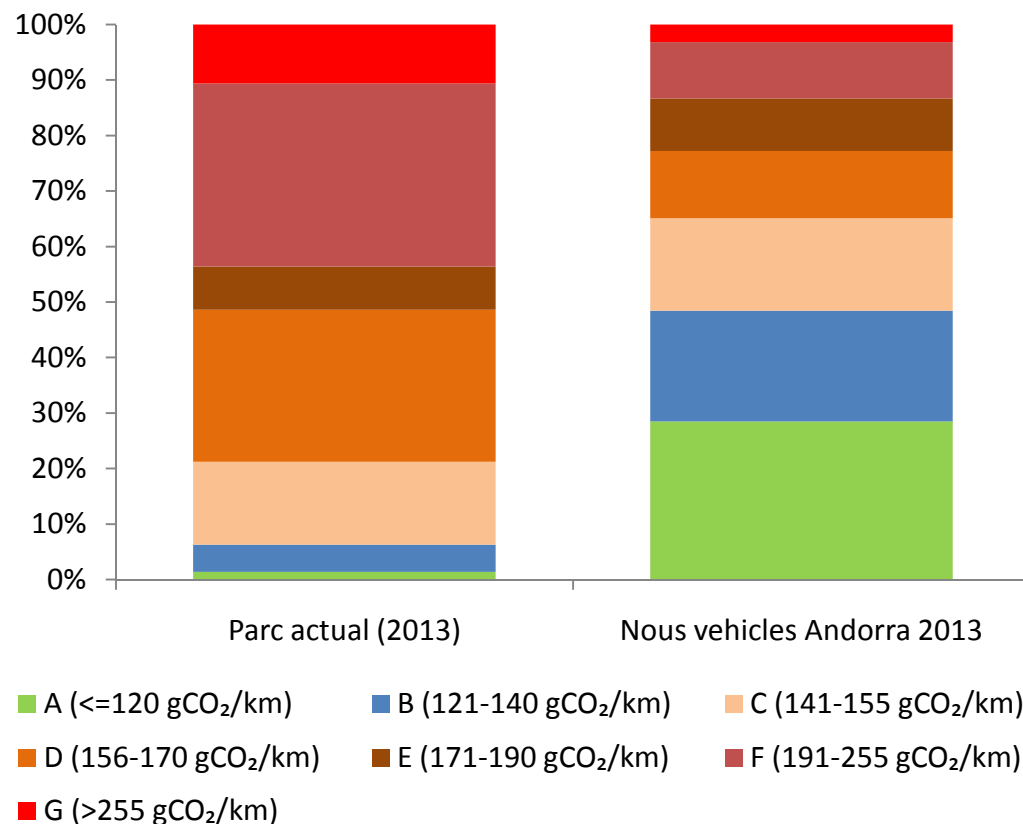
Avaluació del consum energètic final

$$CE = \sum_a \sum_c \sum_{cc} Estoc_{a,c,cc} \cdot Activitat_{a,c,cc} \cdot Consum_{a,c,cc} \cdot ORF$$



Explorant un canvi en l'adquisició de turismes

- Emissions parc turismes 2013= 139.124 tCO₂



- Límit = 105 gCO₂/km
- Estalvi = 1386 tCO₂
- 30% emissions (turismes 2013)
- 1% de les emissions del parc actual

Possibles accions: polítiques energètiques (I)

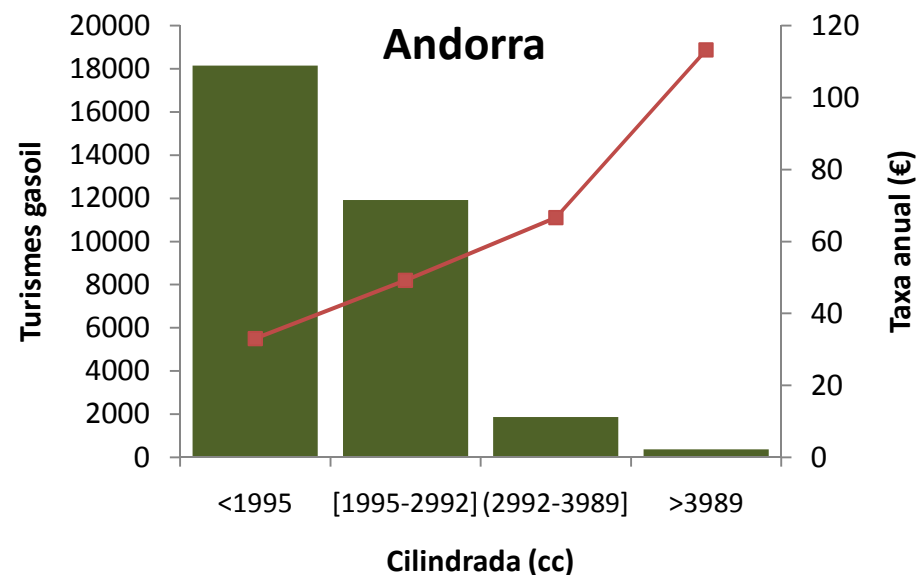
- **Estratègia Unió Europea:**
 - Compromisos dels fabricants en reduir emissions
 - Millorar la informació dels consumidors
 - Promoció de vehicles més eficients a través de mesures fiscals

➤ Etiquetatge energètic

Vehicle Information		
CO ₂ emissions figure (g/km)		
≤ 120 A 120+ to 140 B 140+ to 155 C 155+ to 170 D 170+ to 190 E 190+ to 225 F 225+ G		A 104 g/km
Fuel Use (per mile) for 15,000 Information Actual fuel figure as a reference to the car's actual use as per the manufacturer's information. *This figure is calculated for driving the combined cycle, which includes urban, extra-urban and cycle.		774 litres
Lower fuel use is better		£100
Vehicle Tax (per year) according to the CO ₂ emissions in the vehicle		
Vehicle Registration Tax (VRT) rate Percentage rate of VRT applied to the value of the vehicle is dependent of the CO₂ emissions		14%
Environmental Information		
Agreed on fuel economy and CO ₂ emissions which constitute the basis for all new passenger car models is available at any point of sale free of charge or directly from the Society of the Motor Industry in Upper Pembroke Street, Dublin 8, Tel: 01-478 8200 and address: www.society.ie. In addition to the fuel efficiency of a car, driving behaviour as well as other non-technical factors play a role in determining a car's fuel consumption and CO ₂ emissions. CO ₂ is the main greenhouse gas responsible for global warming.		
Make:		
Model/Version:		
Official CO ₂ emissions (g/km): 104 g/km. This figure may be obtained from the vehicle's Certificate of Conformity or by contacting the dealer. This figure is based on the manufacturer's data. The CO ₂ emissions are calculated according to the European Union standard test cycle.		
Fuel Consumption:		
Drive cycle	Litre/100km	
Urban	12.0	1st type
Extra-urban	7.2	Engine Capacity (cc)
Combined	8.5	1497
		Transmission
		Automatic

Possibles accions: polítiques energètiques (II)

➤ Taxa sobre la tinença de vehicles



➤ Incentius per a la promoció de vehicles més eficients



➤ Incentius per l'electrificació del parc

Agraïments

Moltes gràcies

- Oriol Travesset Baró agraeix l'ajut de tercer cicle al Govern d'Andorra, ATC0012-AND-2013/2014



- Agraïments al Departament d'Indústria i a l'Àrea de Cartografia del Govern d'Andorra per l'aportació de dades