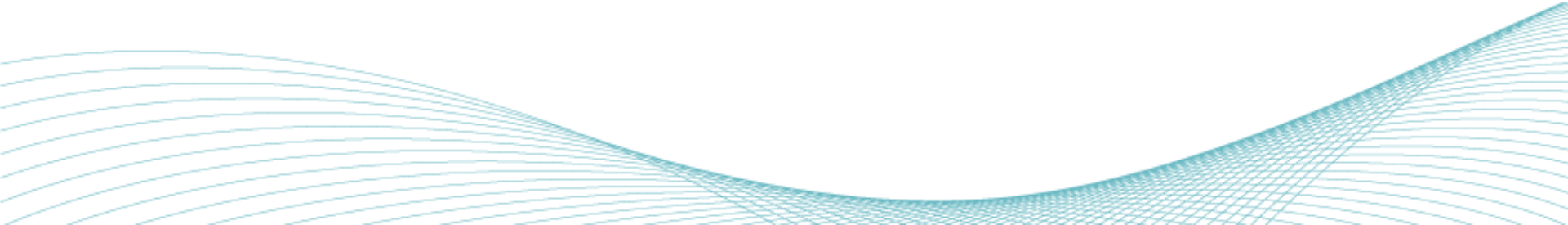
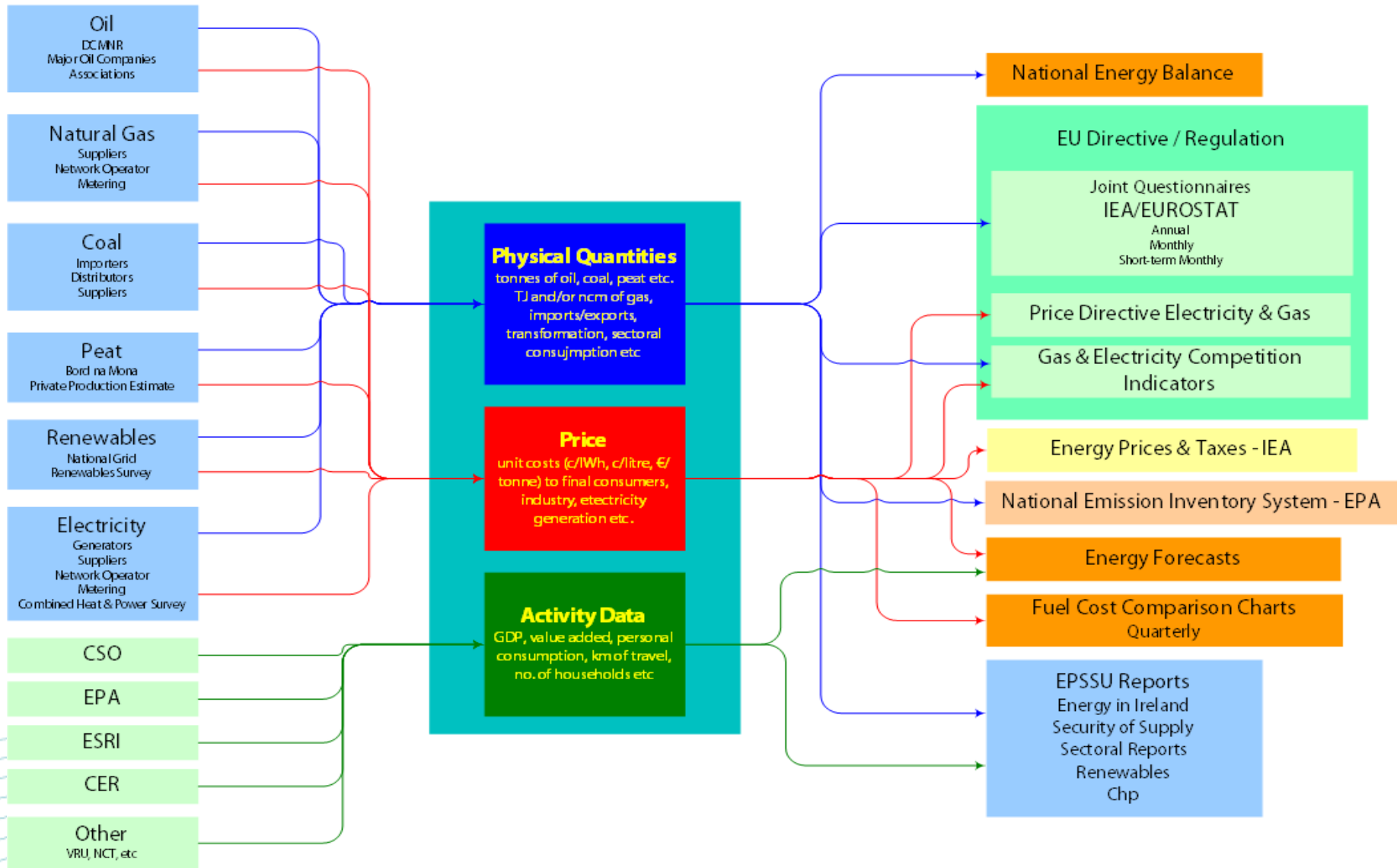


Data gaps and barriers

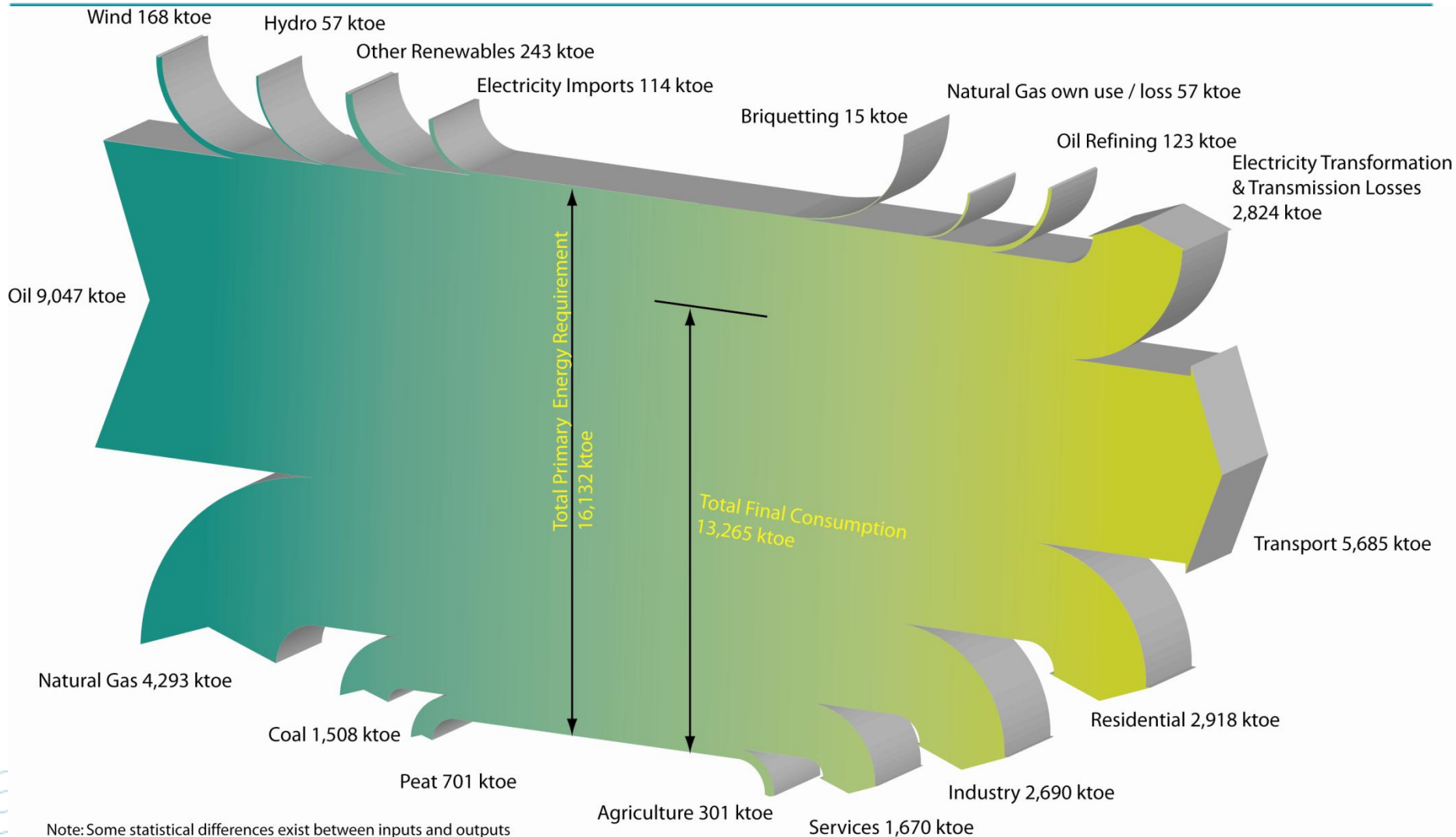
Experience from Ireland

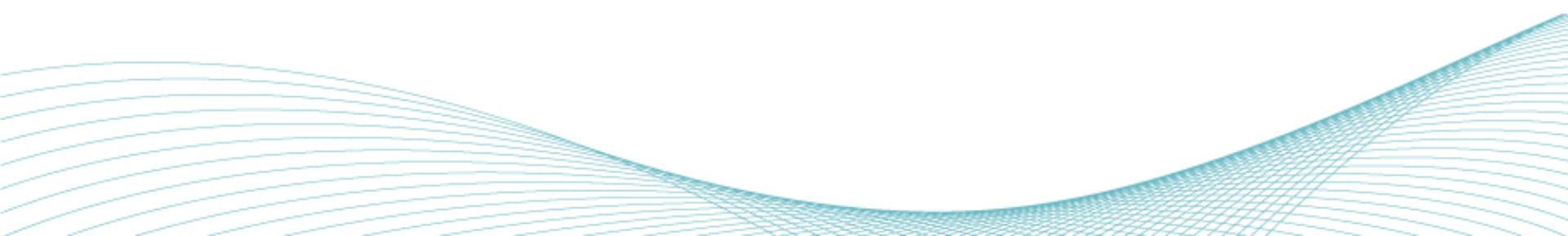
Martin Howley & Dr Brian Ó Gallachóir

- Identifying the need for more detail
 - Example from Transport
 - Disaggregating the energy use by transport mode
 - Example from Industry
 - Sub-sectoral disaggregation of energy use
 - Annex
 - Application of an indicator to inform policy change in transport
 - Monitoring the effect of the policy change
- 




Energy Flow 2007

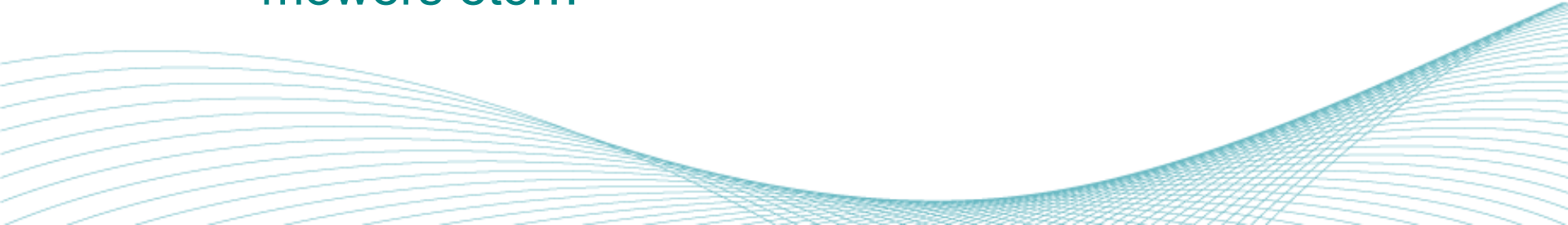


- Dominance of oil (56% of Primary Energy)
 - Small contribution of RE (2.9% of TPER)
 - Losses considerable (19% of TPER)
 - Import dependency 89%
 - 91% of gas use imported
 - Indigenous gas, peat and RE
 - Transport 43% of Final Energy Demand (TFC)
 - Buildings 35% of TFC
 - GHG emissions 24% above 1990 (+13% KT)
- 


Identifying the need

- Involved in ODYSSEE project since 1994
 - Difficulty in producing basic energy indicators
 - Lack of detail in energy balance
 - Not all related activity data available
 - Government Green Paper on Sustainable Energy 1999
 - Introduced the use of indicators for policy analysis
 - Acknowledged the data limitations and established statistical unit in SEI to develop, report and conduct analysis
 - Slow progress but significant advancement and some success in informing and influencing policy
- 

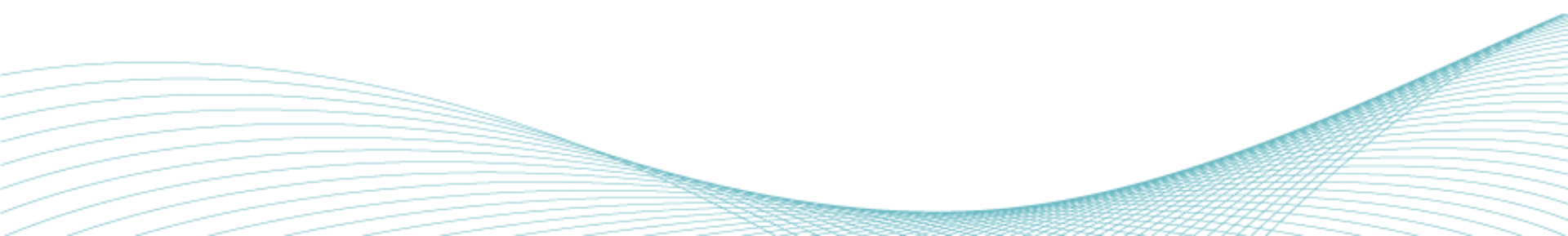
Transport Data Gaps

- Until recently, overall quantities of petrol, diesel and electricity were known
 - Energy use by most modes of transport not known
 - Some pieces of the jigsaw were known
 - Rail
 - Public Bus Passenger Services – excise rebate
 - Air – kerosene, aviation gasoline...
 - Almost all petrol (gasoline) used by private car – but also some taxis, small commercial vehicles and lawn mowers etc...
- 
- A decorative graphic at the bottom of the slide consists of several overlapping, wavy lines in a light teal color, creating a sense of motion and depth.

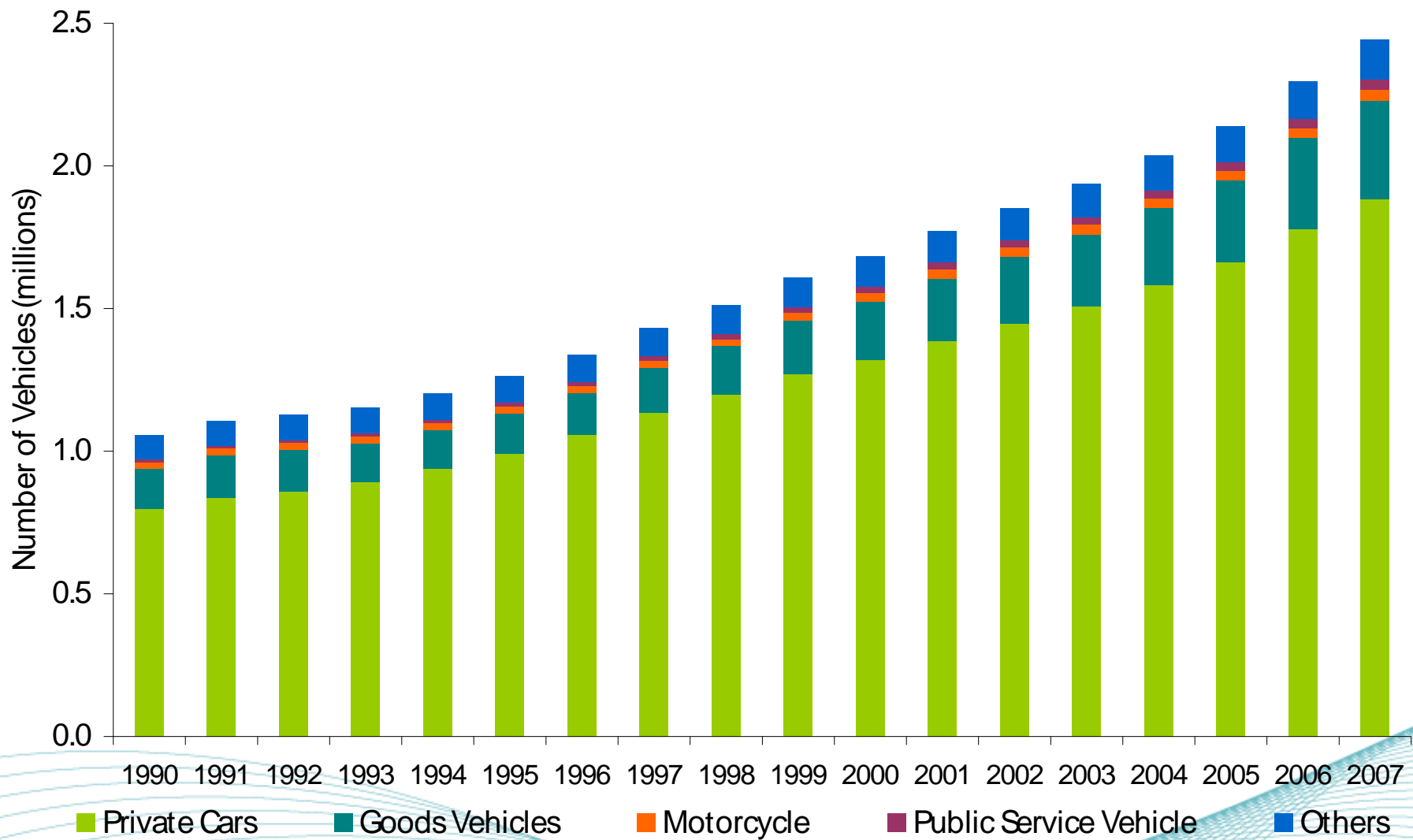
Questions posed (1)

- What is the energy use by different modes of transport?
 - How to split diesel consumption between private cars and goods carriage
 - Which modes are growing fastest?
 - What's driving transport energy growth – private car growth or freight growth...?
 - Are modes becoming more or less efficient?
 - How do transport energy use patterns relate to economic activity?
 - *“You can't control what you haven't measured”*
 - Where should we concentrate policy options
- 
- A decorative graphic at the bottom of the slide consists of several overlapping, wavy lines in shades of light blue and teal, creating a sense of motion and depth.

Questions posed (2)

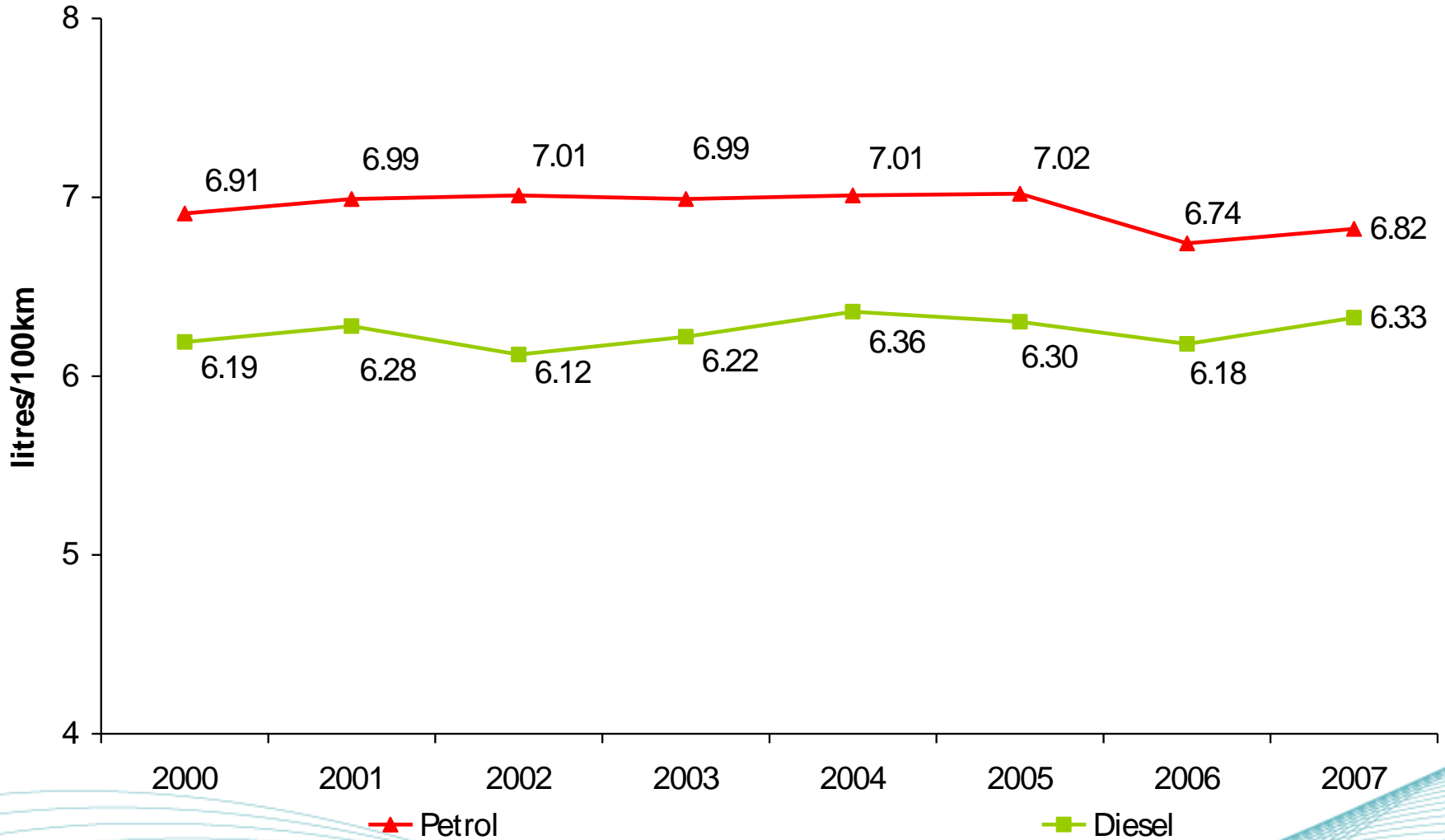
- Freight Transport – transport energy debate centres on private car but what about freight transport, which is growing considerably faster?
 - Car Transport - are purchasing trends (bigger cars) offsetting technical improvements in car engine efficiency?
 - Car Transport – what's the average mileage of passenger cars?
- 
- A decorative graphic at the bottom of the slide consists of several thin, light blue lines that curve and flow across the width of the page, creating a sense of movement and depth.

Profile of Transport Sector

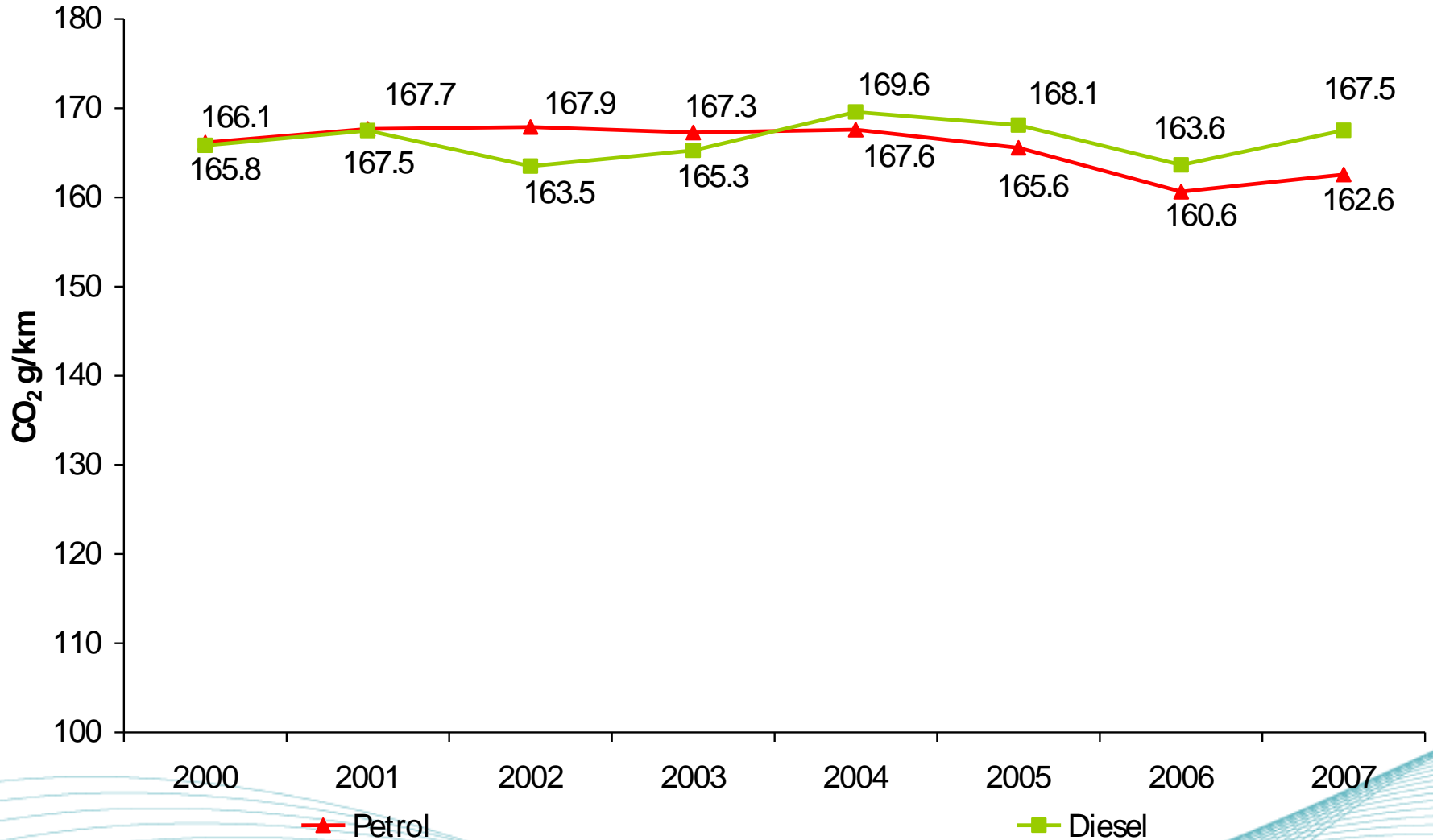


- Vehicle Registration Database
 - Detailed database on vehicles by size, fuel, use etc
 - Weighted fuel efficiency & CO₂ emissions by engine size by linking with car test database
- National car test – introduced in 2000
 - Mileage recorded first after 4 years and then every 2 years thereafter
 - Possible to calculate average annual mileage by engine size from database
- Bottom-up estimate of petrol & diesel consumption
 - annual mileage x fuel efficiency x estimate of on-road adjustment of fuel efficiency
- Similar calculation for taxis
 - Taxis tested annually and mileage recorded

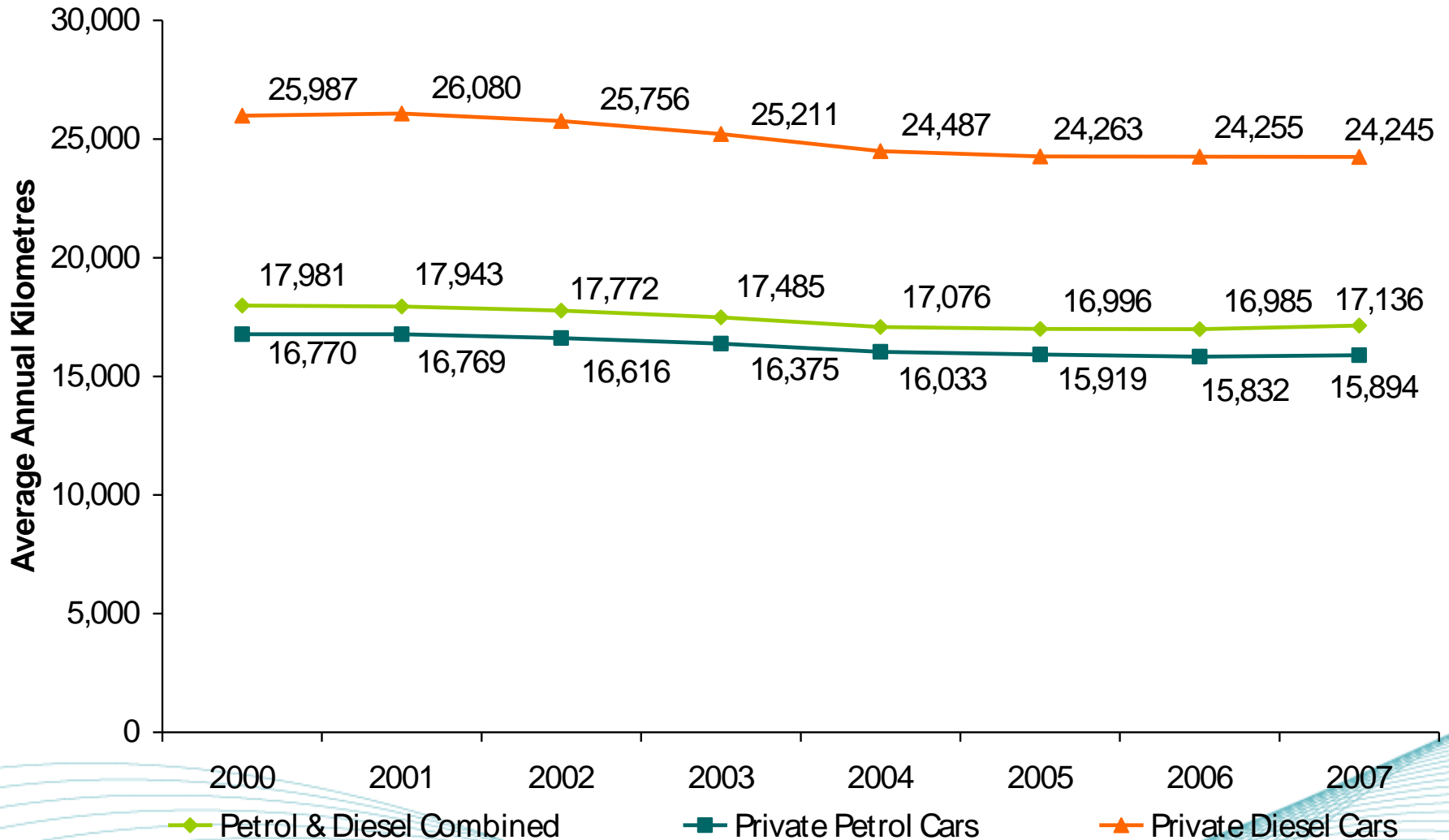
Indicator 1 - Specific Fuel Consumption of New Cars



Indicator 2 - Specific CO₂ Emissions of New Cars



Private Car Mileage



Model Energy Use in Private Cars

Annual Mileage
by engine size
and fuel

X

Fuel Efficiency
of new cars by
engine size

X

Fuel Efficiency
inflated by 20%
for on-road

X

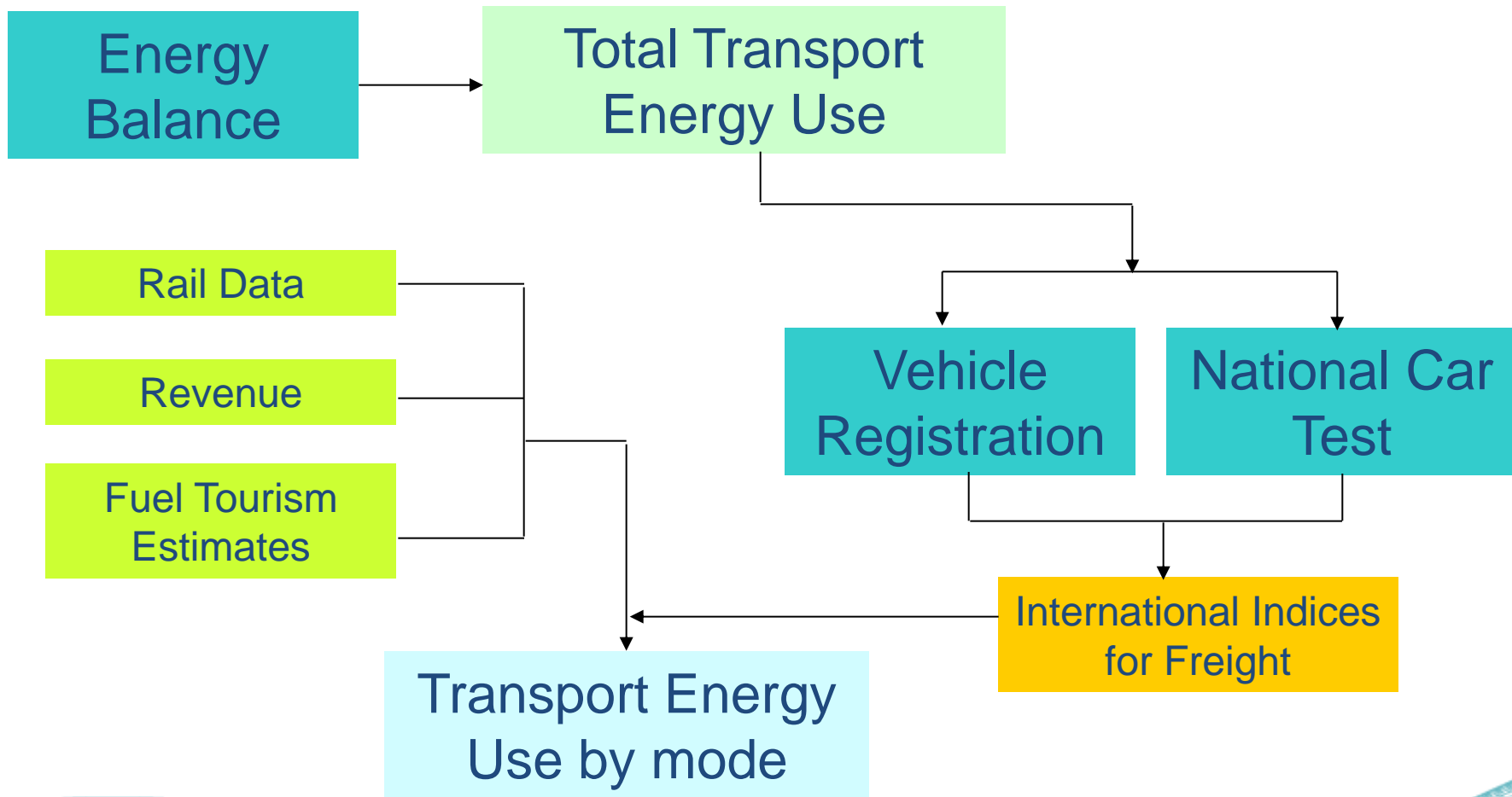
Numbers of
cars in each
engine size
band

=

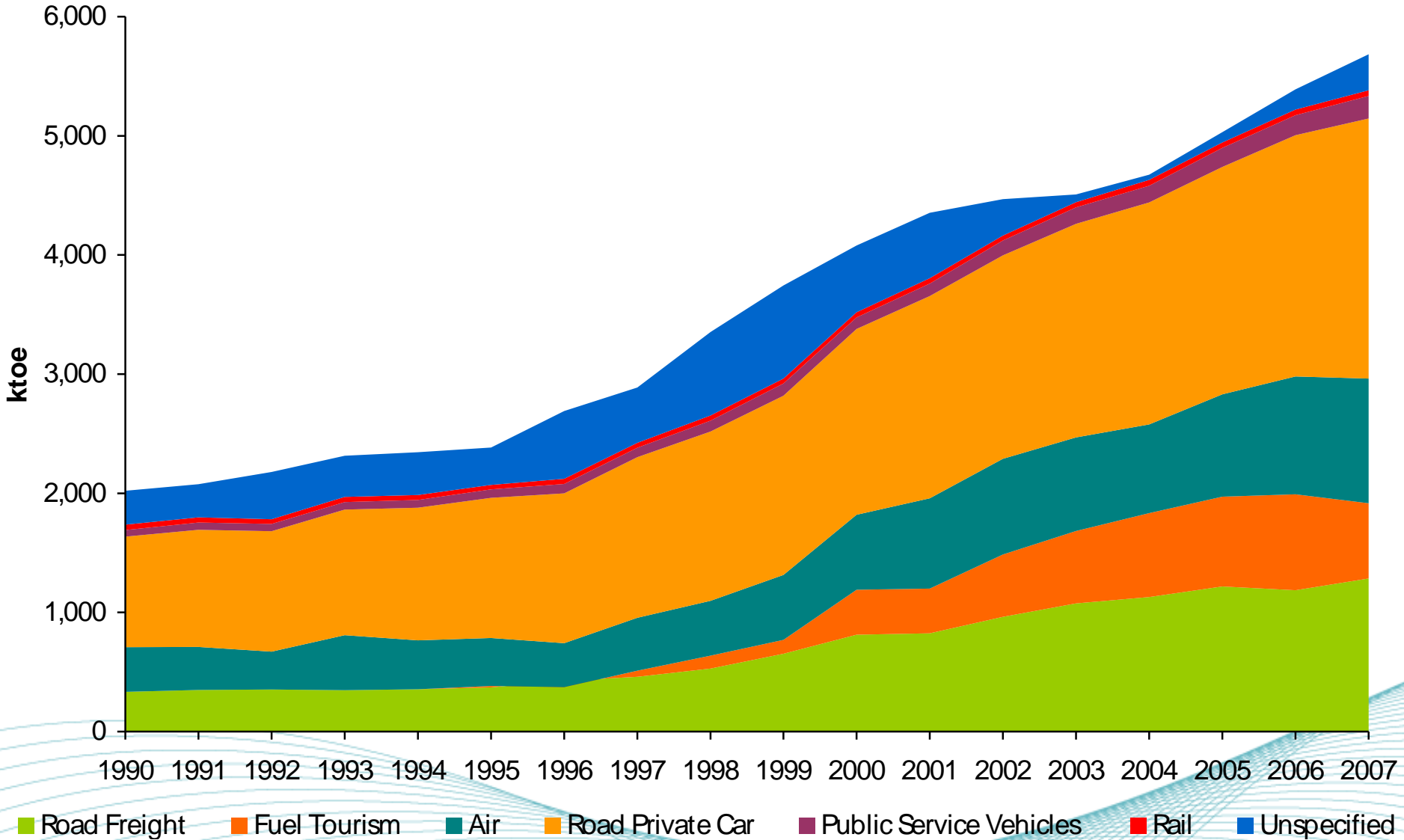
Petrol & Diesel
consumption in
private cars

- Vehicle registration data
 - Numbers of vehicles by unladen weight
- Annual Road Freight Survey (Statistical Office)
 - Vehicle kilometres
 - Tonne kilometres
- Used international estimates of fuel use per tonne kilometre and vehicle kilometre to estimate energy use

Putting it all together




Transport Demand by Mode

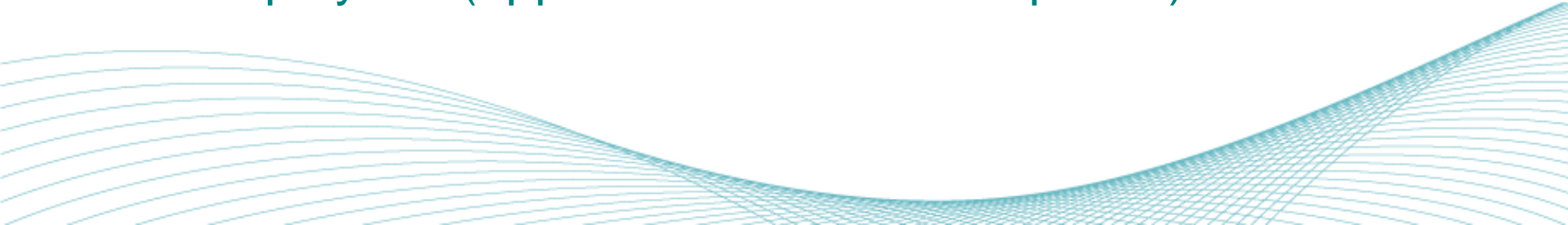


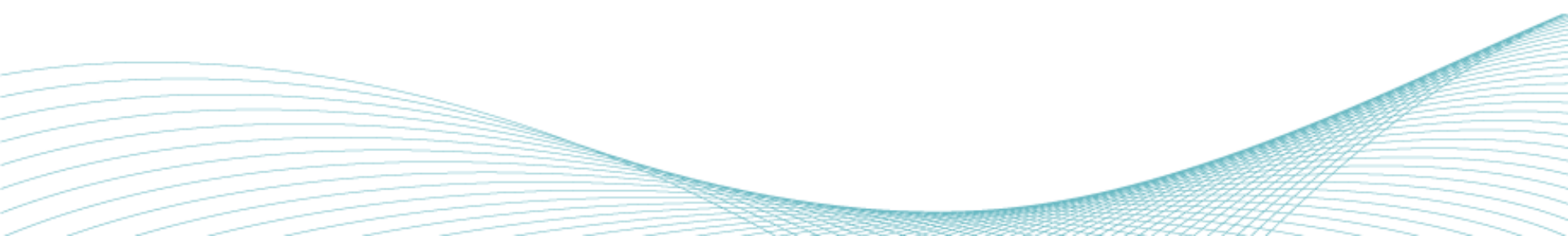
- No additional surveys conducted
- Value added from administration data
- Cost?
 - 3 person months (student work placement)
 - plus database development
- Data access
 - initial resistance
 - bona fida established and added value recognised
- g CO₂/km now recorded on the vehicle file

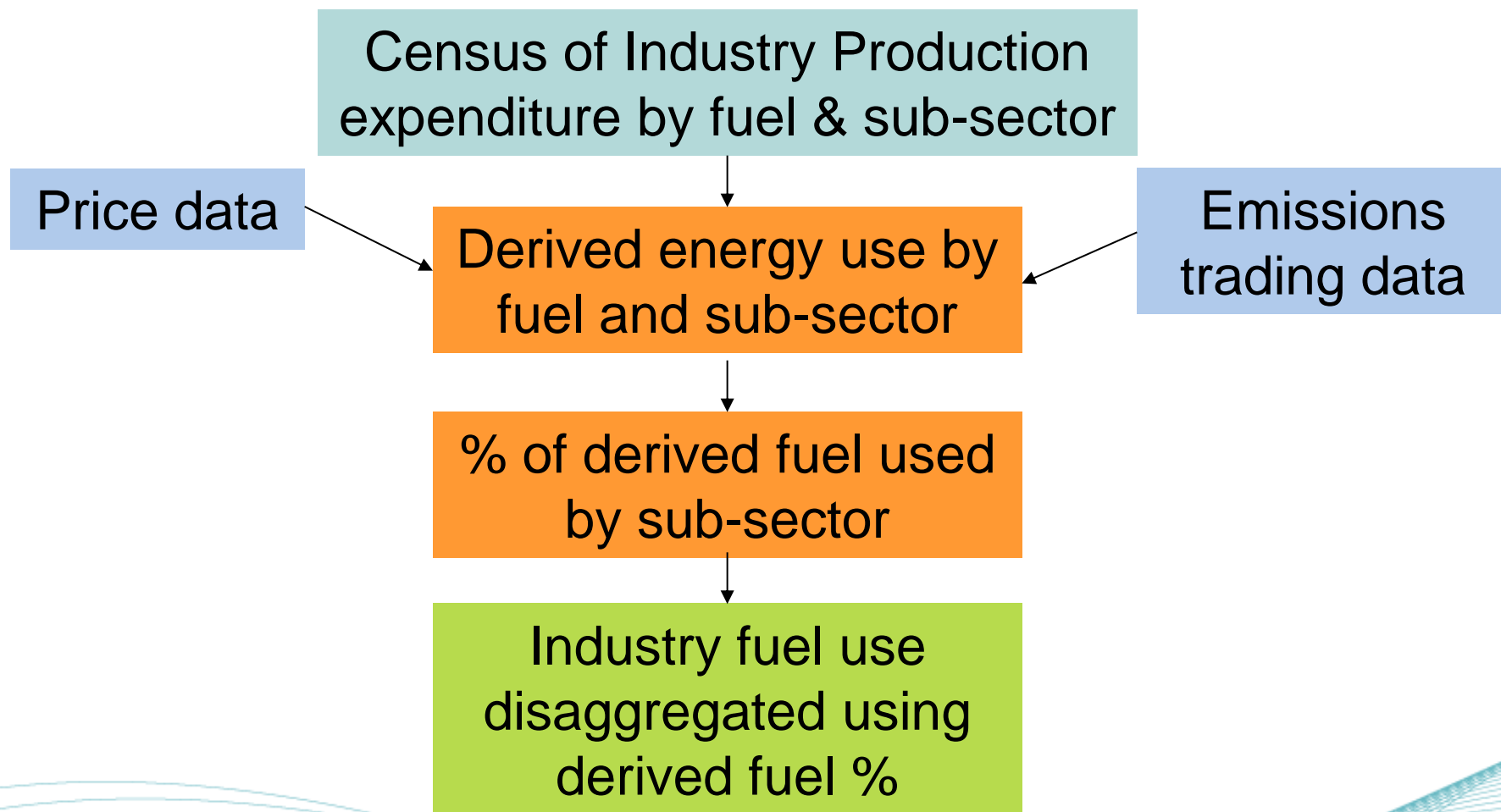
Next steps / improvements in Transport data

- Passenger travel by car – occupancy rates
 - On road fuel efficiency of private car fleet
 - Comprehensive transport survey?
 - Include fuel consumption questions in road freight survey
 - Improve fuel tourism estimates
 - Utilise improved data on air travel patterns
 - Start new data collection on domestic navigation
- 

- Overall quantities of energy were known
- Disaggregated energy was based on breakdown in 1990
- Energy use in sub-sectors did not correspond to economic activity
- Indicators such as intensity at constant structure not possible without matching data
- Barriers to filling the gaps
 - Reluctance to increasing response burden on industry
 - Resources – technical and financial
 - No history or culture of reporting energy quantities

- Annual Survey by Central Statistics Office
 - Population sample for general CIP questions
 - Detailed questions on energy expenditure by fuel type asked in 1990, 1998, 2001, 2004 and annually now
 - Detailed fuel questions only asked from sample
 - Pre 2004 these questions were asked to enterprises with energy bill > €250,000
 - 2004 onwards – all enterprises with more than 20 employees (approx. 30% of all enterprises)
- 
- A decorative graphic at the bottom of the slide consists of several overlapping, wavy lines in shades of light blue and teal, creating a sense of movement and depth.

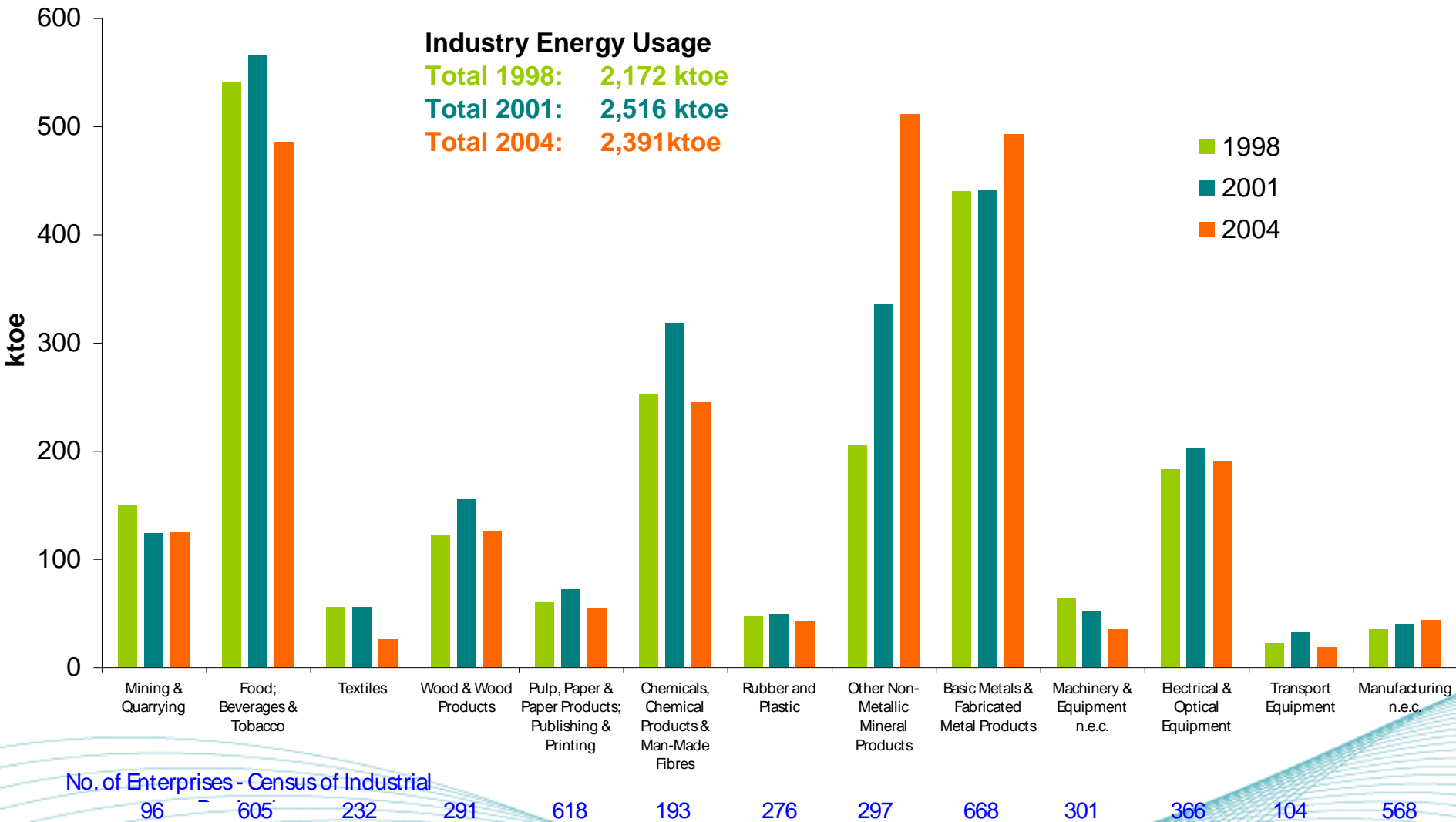
- Expenditures in all enterprises imputed from sample by CSO
 - Quantities of each fuel calculated from expenditure using average prices by SEI
 - Quantities also calculated by sub-sector of industry
 - Overall fuel figures from energy balance disaggregated using calculated shares of fuels in each sub-sector
 - Data for intervening years interpolated
- 



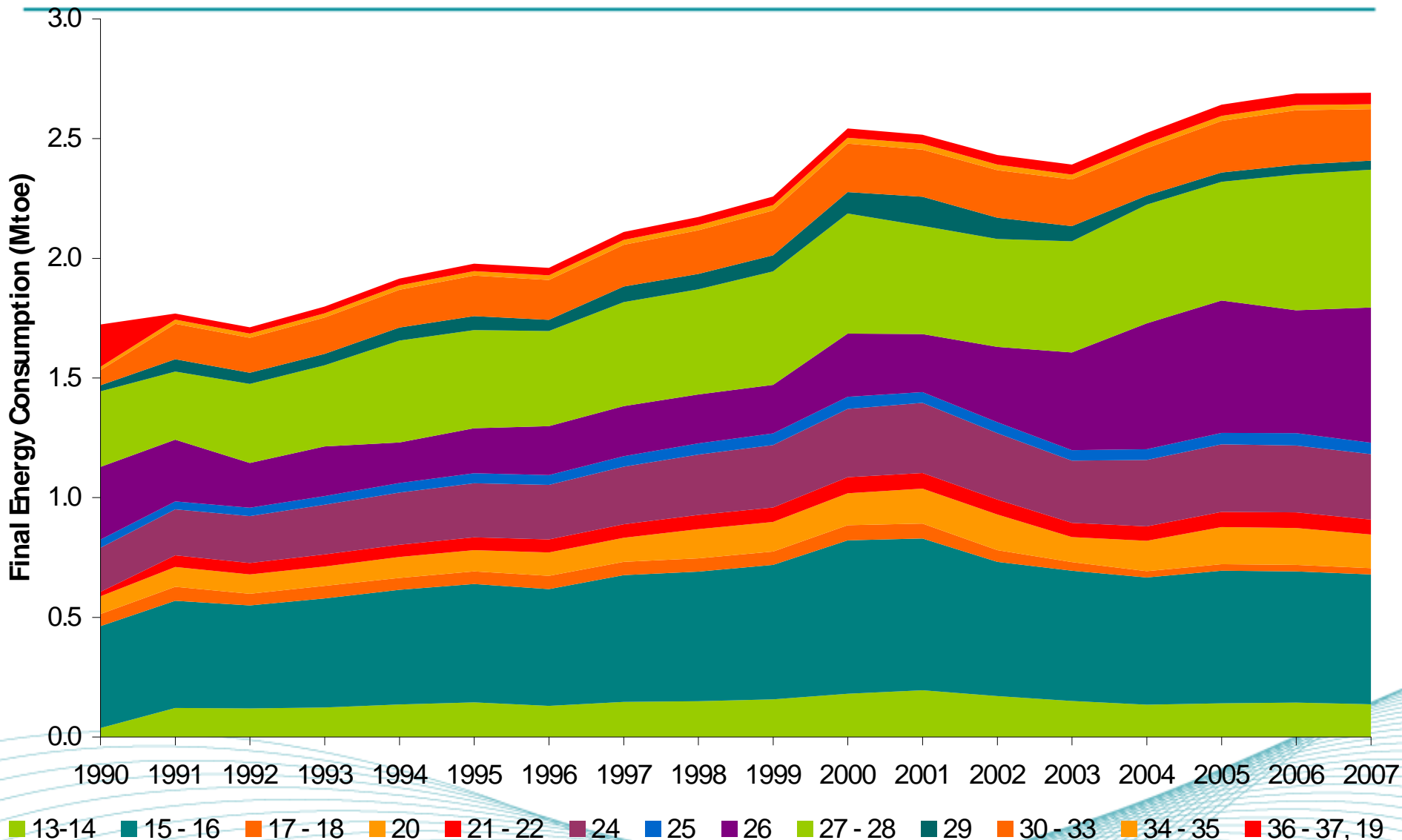
Industry Energy Usage '98, '01 & '04

Industry Energy Usage
Total 1998: 2,172 ktoe
Total 2001: 2,516 ktoe
Total 2004: 2,391ktoe

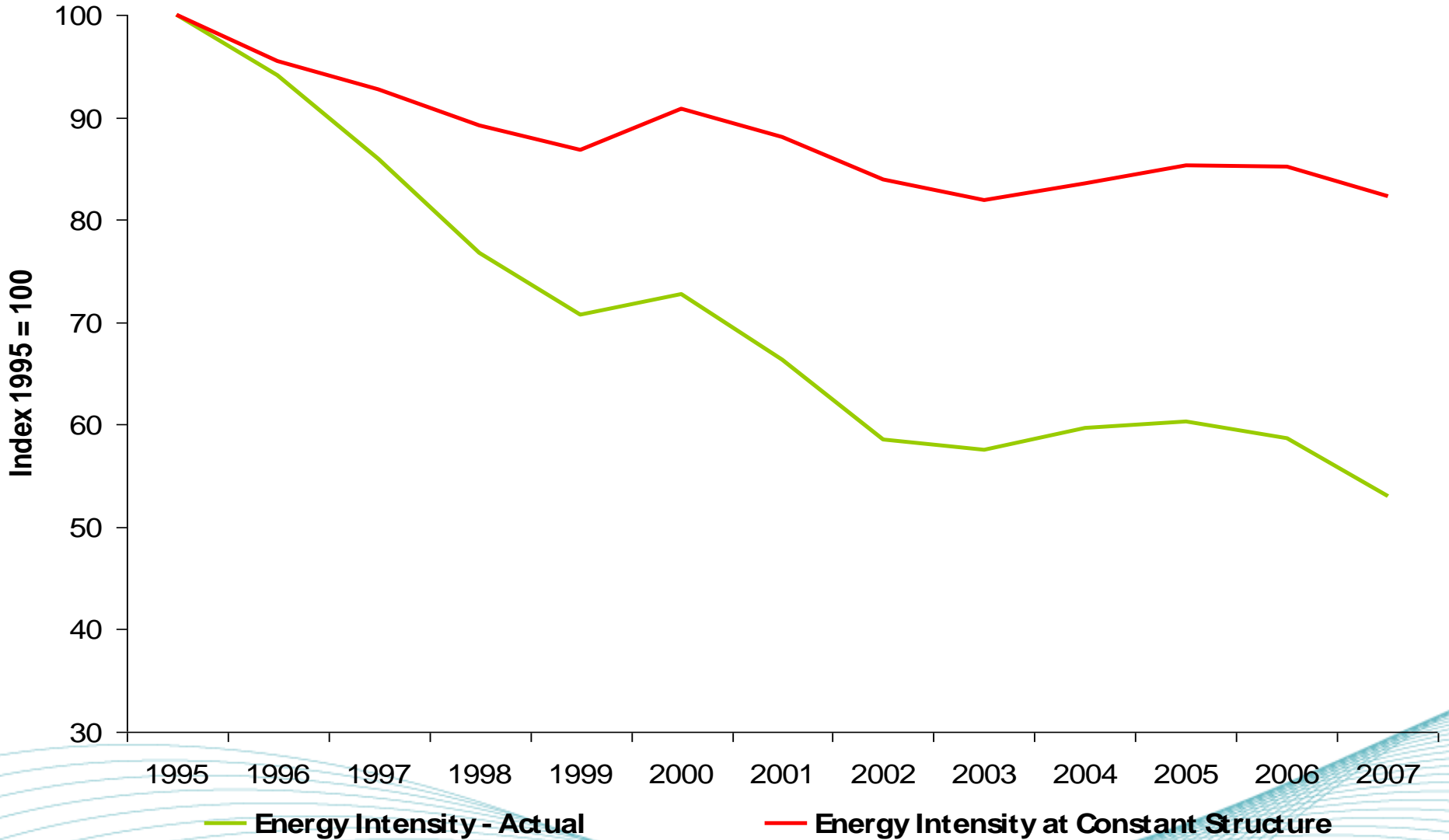
■ 1998
 ■ 2001
 ■ 2004



Industry energy use 1990 – 2007 (interpolated)

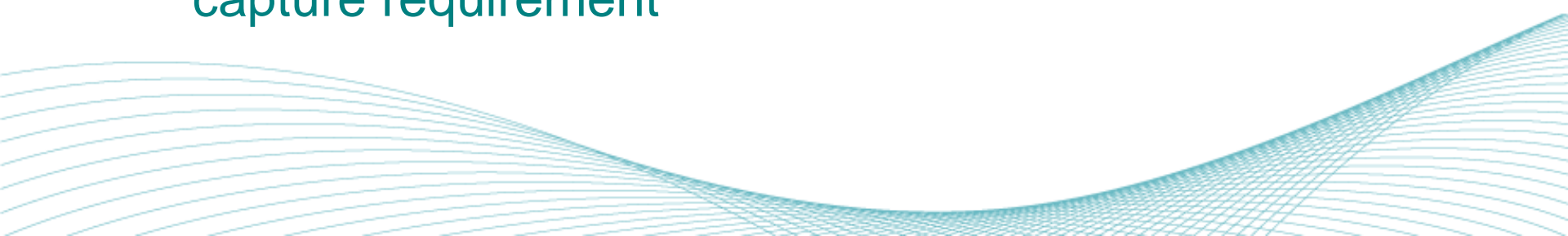


Industry Energy Intensity



Next steps / improvements in Industry data

- Need for official publication of subsectoral value added in constant prices
- Dedicated energy survey – quantities and cost
- Emissions trading / non-emissions trading split
 - energy
 - economic variables
- End use data?
- Recommendation to attach data requirements to any measures implemented

- Administrative data sources available that are amenable to mining and analysis
 - increase detail in energy statistics
 - reduce response burden
 - Additional data sources exists but are more difficult to access
 - meter data from the regulated energy markets
 - New surveys required to obtain “*real*” data
 - New policies and measures should incorporate data capture requirement
- 


- Sustainable Energy Ireland www.sei.ie
- Energy in Ireland 1990 – 2007
http://www.sei.ie/Publications/Statistics_Publications/Energy_in_Ireland/Energy_in_Ireland_1990-2007.pdf
- Energy in Transport - 2007 Report
http://www.sei.ie/Publications/Statistics_Publications/EPSSU_Publications/Energy_in_Transport/EPSSU_Transport_Rpr_Fnl_Dec07.pdf
- Transport Statistics – mileage & fuel efficiency
<http://www.cso.ie/px/sei/database/SEI/Transport%20Statistics/Transport%20Statistics.asp>
- Energy in Industry – 2007 Report
http://www.sei.ie/Publications/Statistics_Publications/EPSSU_Publications/EPSSU_Industry2007_rpt_Fnl_Jun07.pdf

Data gaps and barriers Experience from Ireland

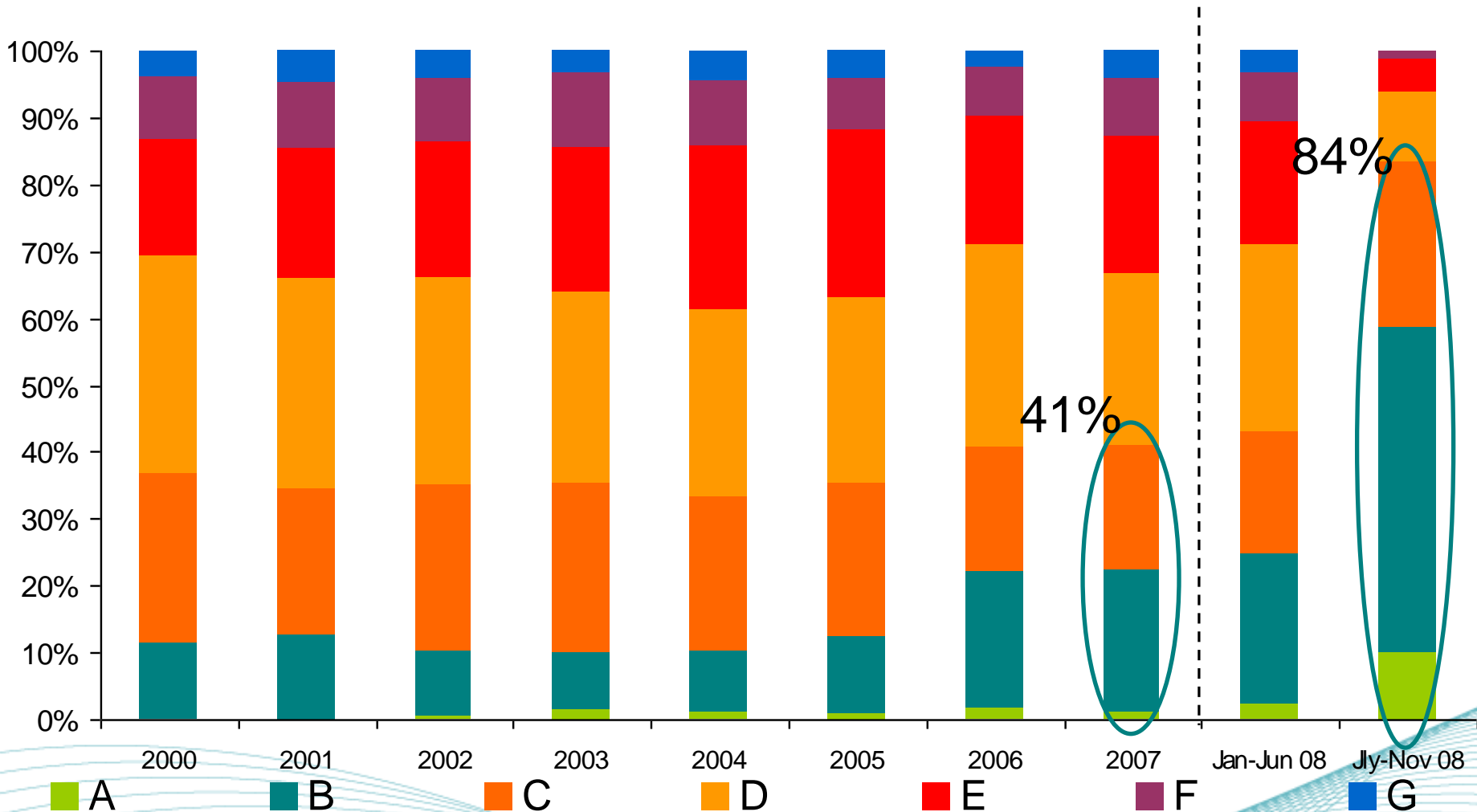
Annex

- Transport was the fastest growing sector in energy terms in 2007 and over the period 1990 – 2007
- 5.5% growth in 2007
- 6.3% annual (181% overall) growth 1990 – 2007
- Growth in 2007 by fuel;
 - Petrol 1.9%
 - Diesel 7.4%
 - Kerosene 5.6%
- National Climate Change Strategy (2000) proposed change basis for Vehicle Registration Tax and Annual Road Tax system from engine size to emissions performance

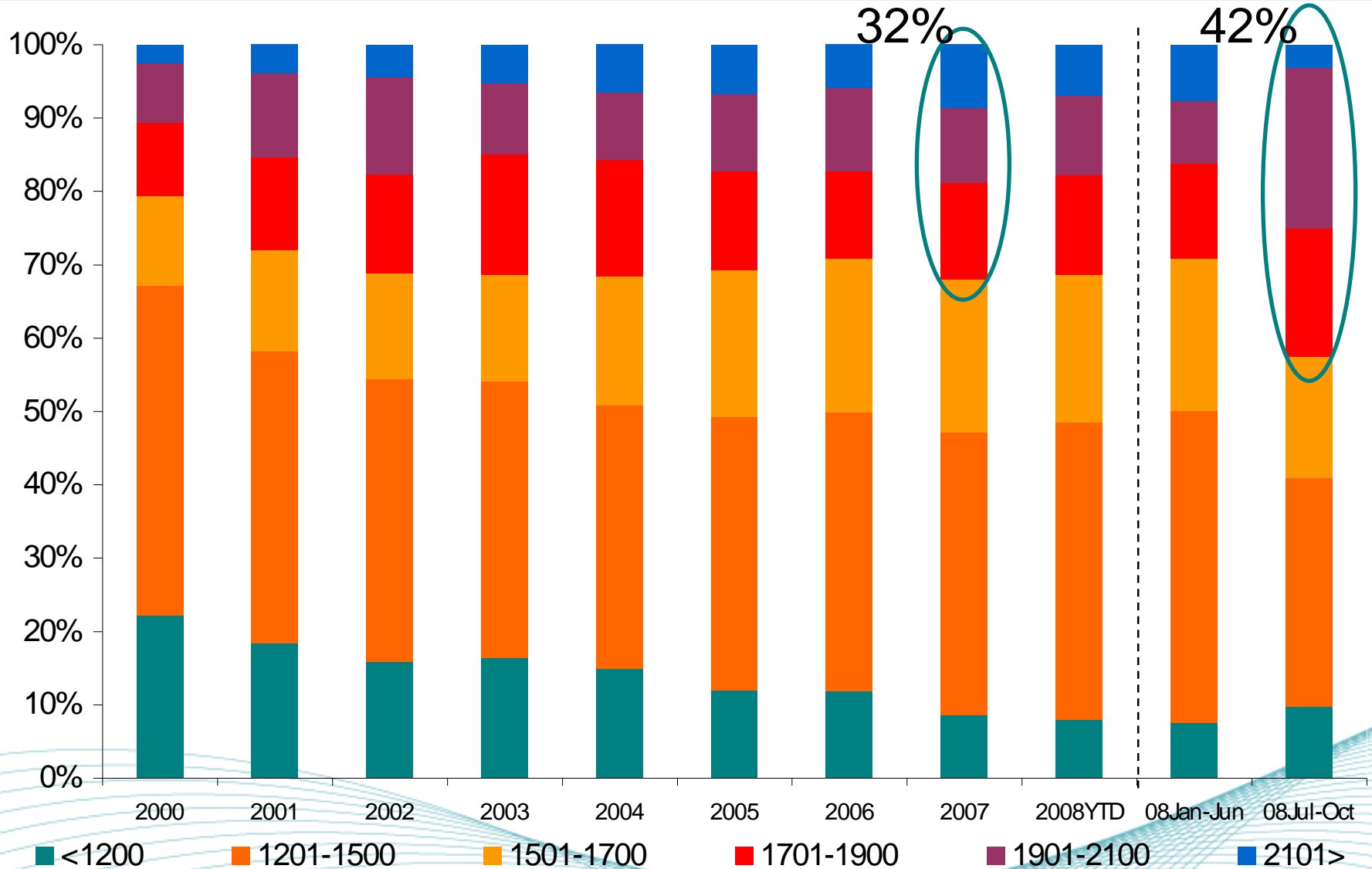
Change to private car registration & road tax

- Government call for consultation in 2006
 - Three options proposed;
 - Adjusting VRT rates for existing engine bands
 - Two options around retaining the current engine size bands and VRT rates but apply a discount and levy depending on CO₂ emissions
 - SEI recommended complete change to a system that was solely based on emissions
 - Backed by evidence based analysis
 - Change to CO₂ based registration system announces in 2007 budget (Nov '07) and took effect in July 2008
- 


Shares of new cars in each emissions band 2000 – Nov 2008



Shares of new cars in each engine size band 2000 – Nov 2008



Case Study Summary

- Policy goal (tax change) flagged in 2000
 - SEI sought and secured detailed data 2001
 - SEI demonstrated purchasing trends offsetting efficiency gains 2004
 - Policy consultation 2006 – basis of SEI proposal adopted
 - Policy implemented July 2008 (flagged Dec 2007)
 - SEI monitored significant policy response Dec 2008
 - Jan – Dec 2007 **41%** of new cars < 155 gCO₂/km
 - July – Nov 2008 **84%** of new cars < 155 gCO₂/km
 - No significant purchasing trend change in engine sizes
 - Within each size band more efficient cars are being purchased
- 

Data gaps and barriers Experience from Ireland

Thank you.