



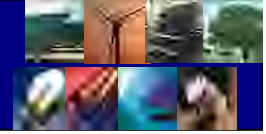
**Brendan Power**  
Energy Engineer, TEA



# Limerick Clare Energy and Emissions Balance

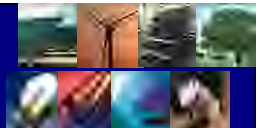
University of Limerick, 18<sup>th</sup> May 2006





# Summary Slide

- Aims and Objectives
- Key Characteristics/ Trends
- EU & Ireland
- Study Methodology
- Key Energy Sites
- Study Area Key Issues
- Key Results:
  - Clare County, Limerick County, Limerick City
- Conclusions
- Individual Responsibility



# Sponsors & Supporters

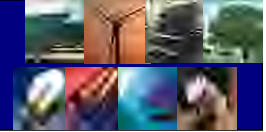


Limerick County Council



Clare County Council

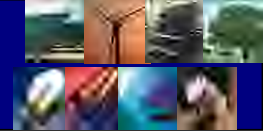




# LCEA and TEA

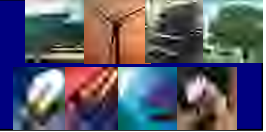
- LCEA established in 2005
  - Energy Balance and Climate Change Strategies key outcomes for first 12 months
  - LCEA first LEA to be funded locally
- TEA established since 1997
  - 5 Full Time Staff plus contract staff
  - Wide range of experience in energy projects
  - Has completed similar energy balance for Co. Tipperary





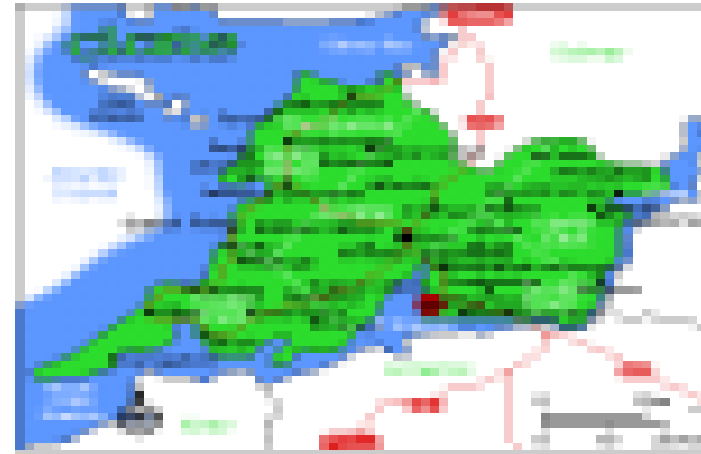
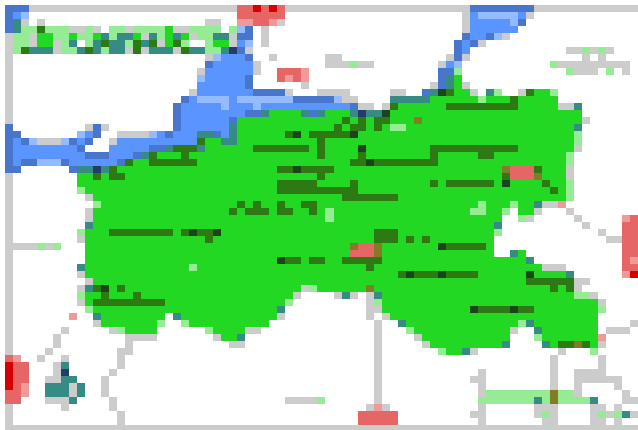
# Aims and Objectives

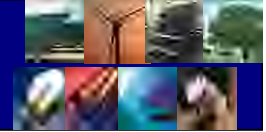
- Aim
  - To produce an overview of current energy consumption and energy related emissions by sector and fuel for the study area
- Objectives
  - Gather appropriate information, data on a National, Regional and local basis to inform the study
  - Analyse current energy use by sector and fuel in the study area
  - Project energy use by sector and fuel in the study area to 2010 and 2015
  - Assess the situation in terms of meeting regional requirements under the Kyoto Protocol.
  - Make appropriate conclusions and recommendations in terms of future energy supply in the region.



# Study Area

Limerick County, Clare County and Limerick City

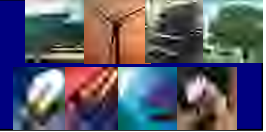




# Key Characteristics/ Trends

- The Area accounts for approximately 6% of the National Population
  - ~278,000 people in 2002
- The study area covers over 6,000 square kilometres.
- Total number of households in 2004 estimated at 96,000
- Vehicle ownership has increased dramatically in the region, mirroring the National trends, with a 100% increase evident between 1990 and 2004.
  - ~147,000 vehicles in 2004
- 6.5% of the National employment in the Industrial and Commercial Sectors is based in the study region.
  - ~110,000 people in 2004

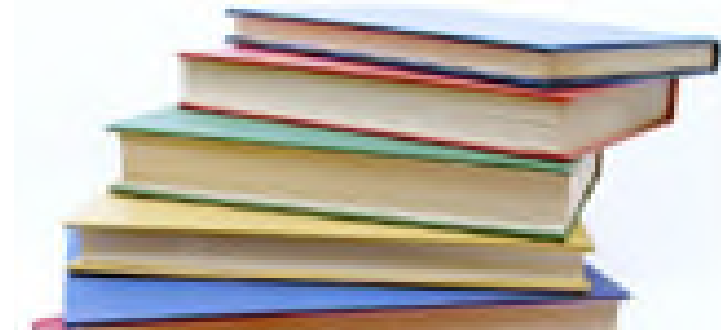


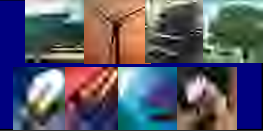


# Energy and Emissions Balance Contents

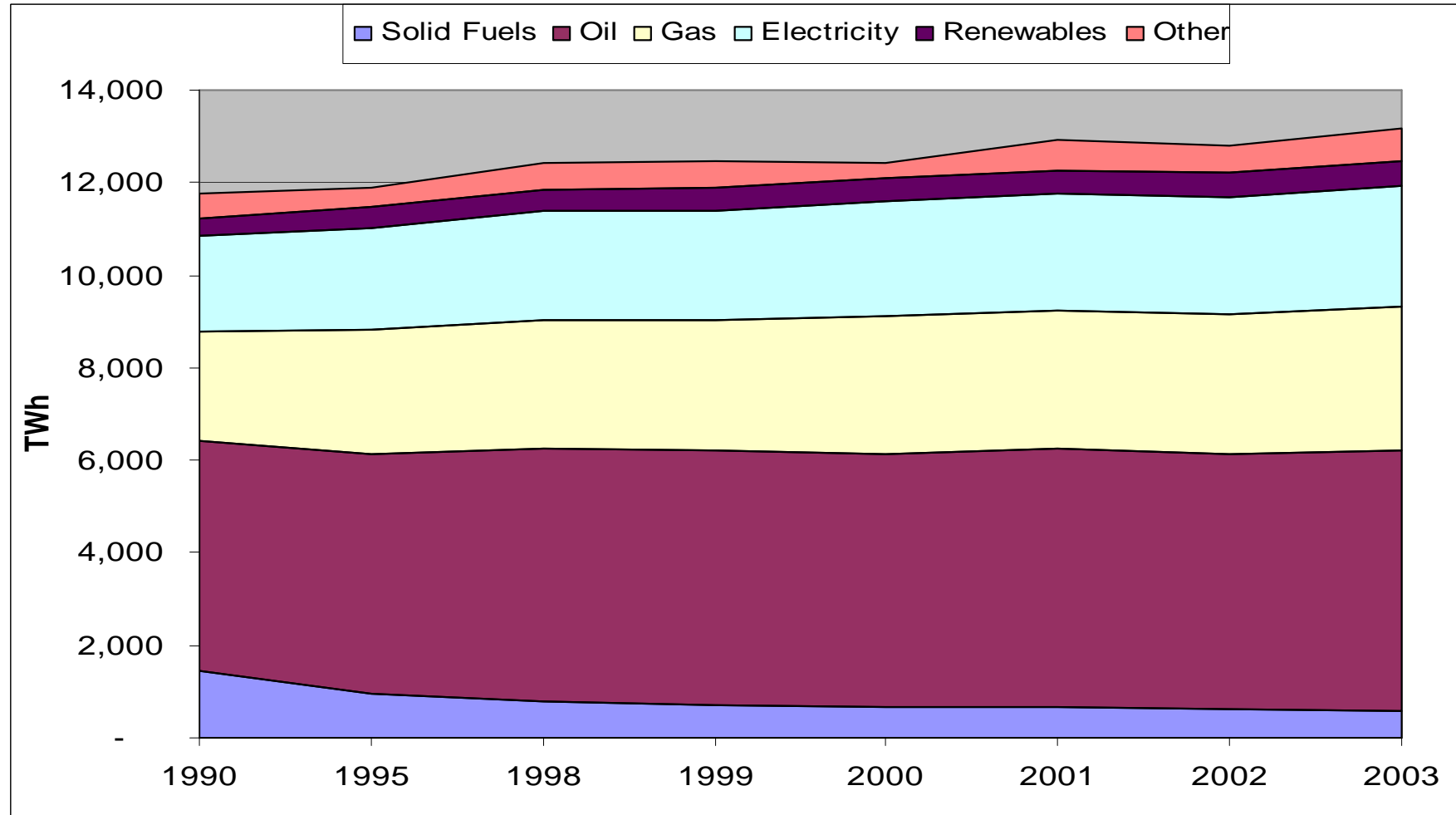
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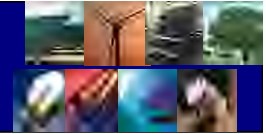
- Introduction
- Global Energy and Environment
- Climate Change Conventions
- Energy and Environmental Emissions in Ireland
- Regional Statistics
- Energy Balance Methodology
- Key Energy Sites in Study Area
- Study Area Summary Results
- Clare County
- Limerick County
- Limerick City





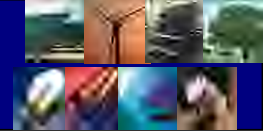
# EU Final Energy Consumption - By Fuel





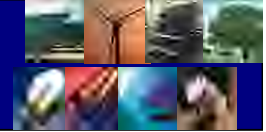
# Ireland and the Kyoto Protocol

<b>Energy Related Emissions</b>	<b>Total Emissions '000 tonne-CO<sub>2</sub></b>	<b>Projected Difference to Target '000 tonne-CO<sub>2</sub></b>	<b>Projected Cost of CO<sub>2</sub> / T Trading Price (€)</b>	<b>Annual CO<sub>2</sub> Costs (Million €)</b>
1990 Levels	30,649	-	-	-
Kyoto Targets +13%	34,635.4	-	-	-
2005 Estimate	43,758	9,125	27	246
2010 Business As Usual	51,451	16,818	35	589



# Study Methodology

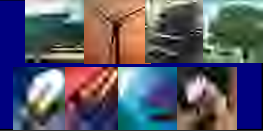
- Energy Consumption as base data which is a measure of the energy delivered to end users. This is also referred to as Total Final Consumption (TFC)
- Extraction of key energy sites from data
- Use appropriate ratios to calculate local data
- Data to be calculate by fuel and by sector
- Using energy consumption and emissions factors to calculate emissions
- Only Energy related emissions to be assessed
- Key indicators to be developed for National comparisons
- Quantified Indicative Reductions (QIRs) to be developed for further Climate Change Strategy



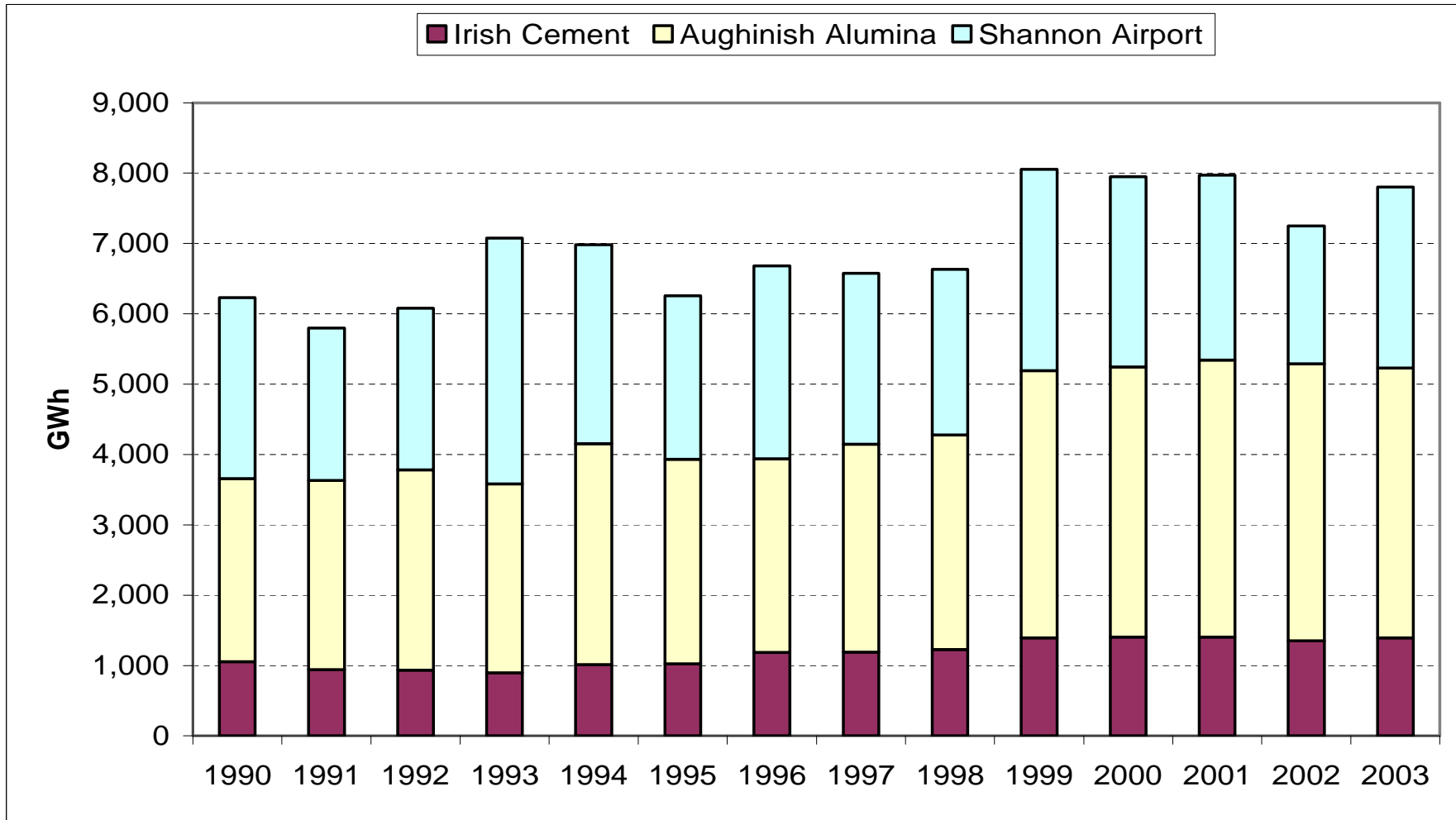
# Key Energy Sites

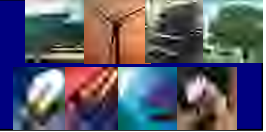
- Energy Production
  - ESB Power Station, Moneypoint Co. Clare
    - Largest Power Station in Ireland.
    - (5,500 GWh in 2004)
  - Ardnacrusha Hydro Plant
- Energy Consumption
  - Aughinish Alumina, Co. Limerick
  - Irish Cement, Castlemungret, Co. Limerick
  - Shannon Airport, Co. Clare





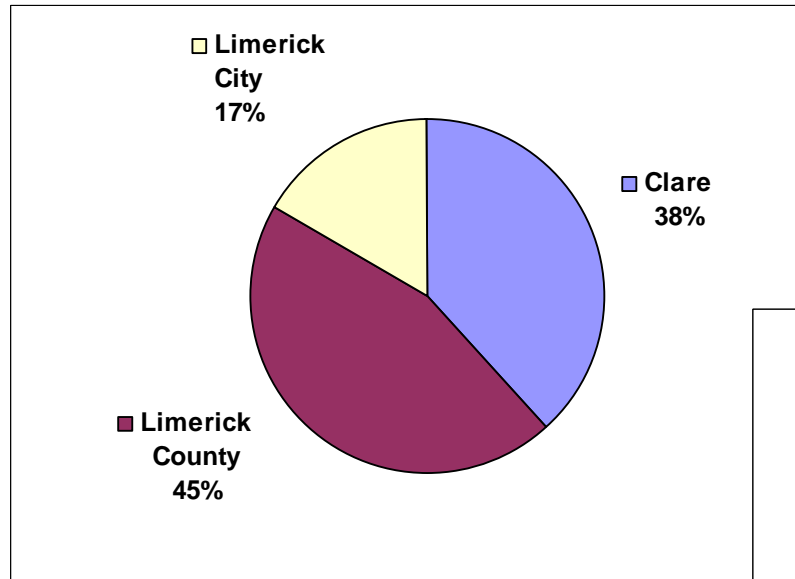
# Key Energy Sites – Energy Consumption





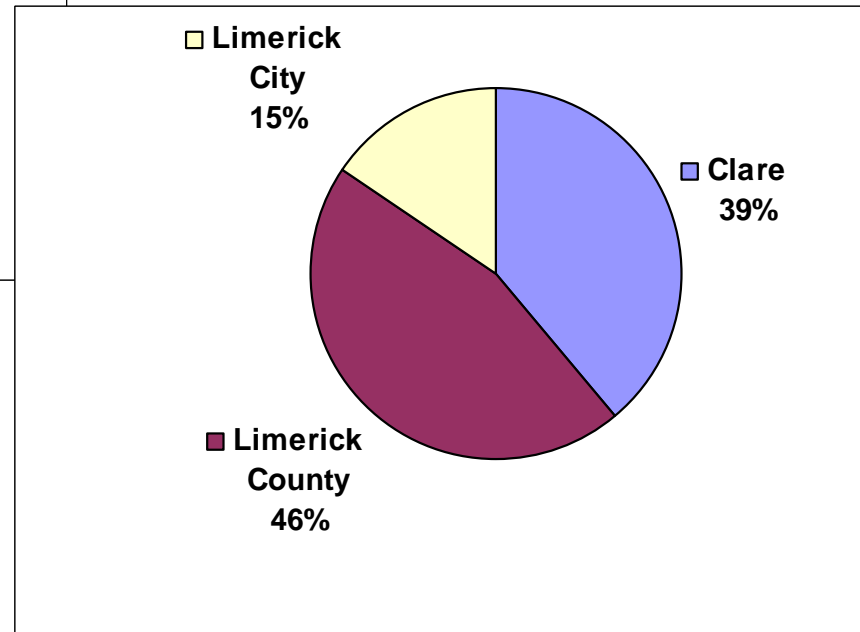
# Study Area

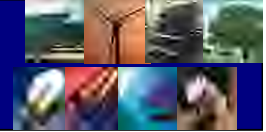
## Energy Consumption and Emissions by Area



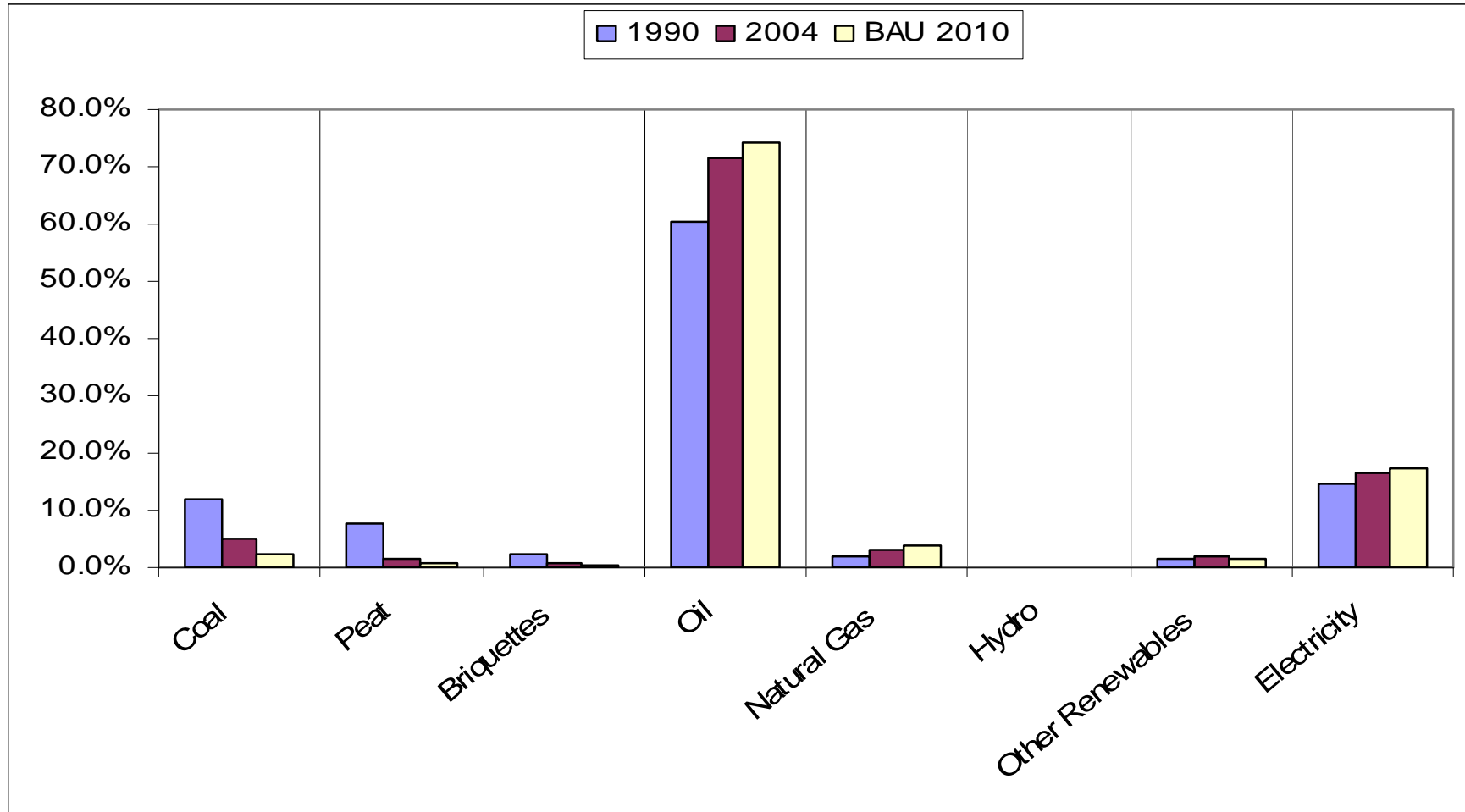
**Energy Consumption  
by Area  
9,945.4 GWh**

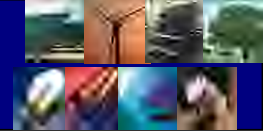
**CO2 by Area  
3,159,800 tonnes CO2**



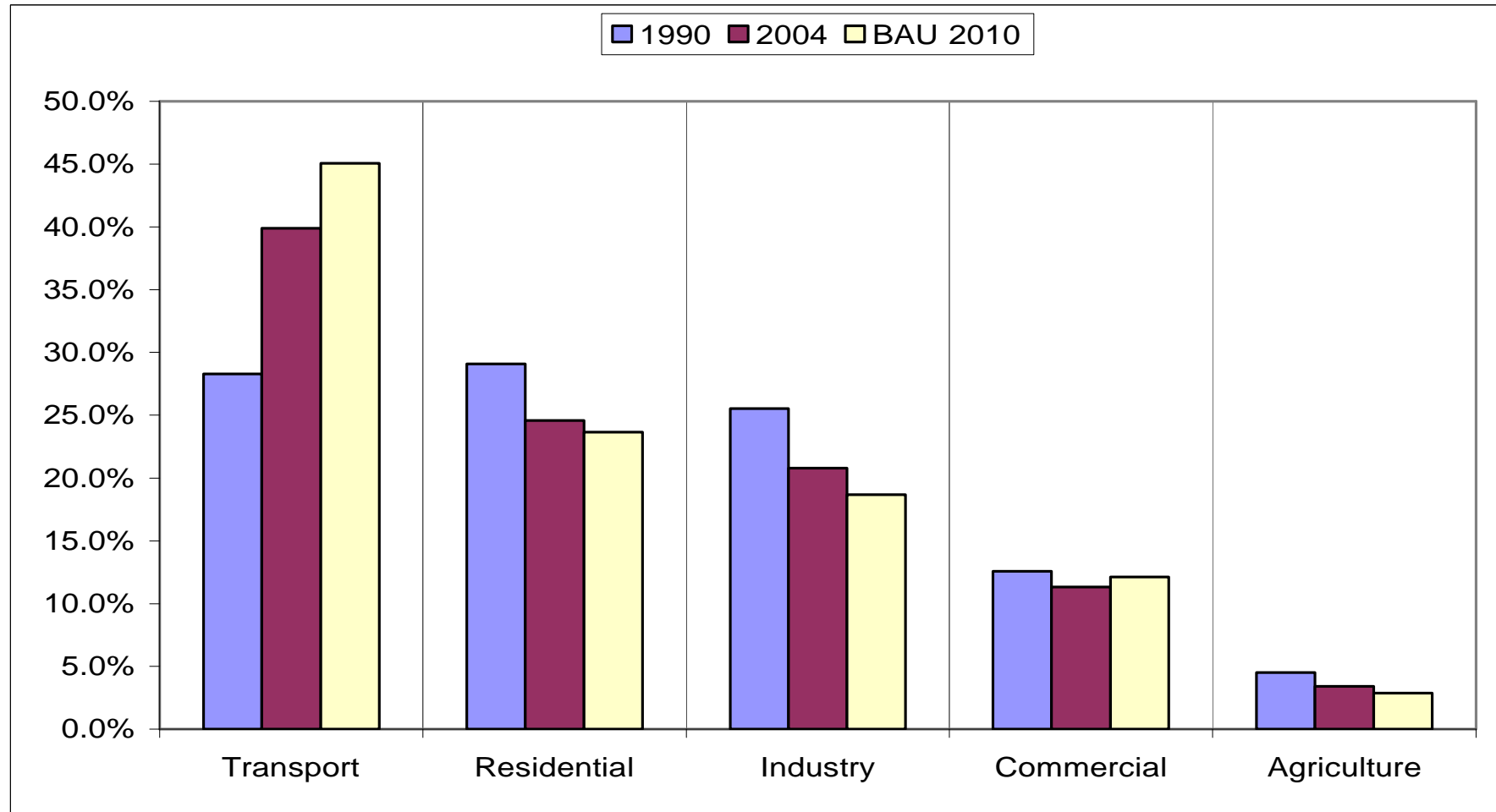


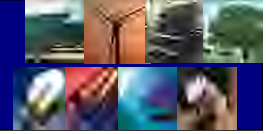
# Study Area – Energy Consumption by Fuel



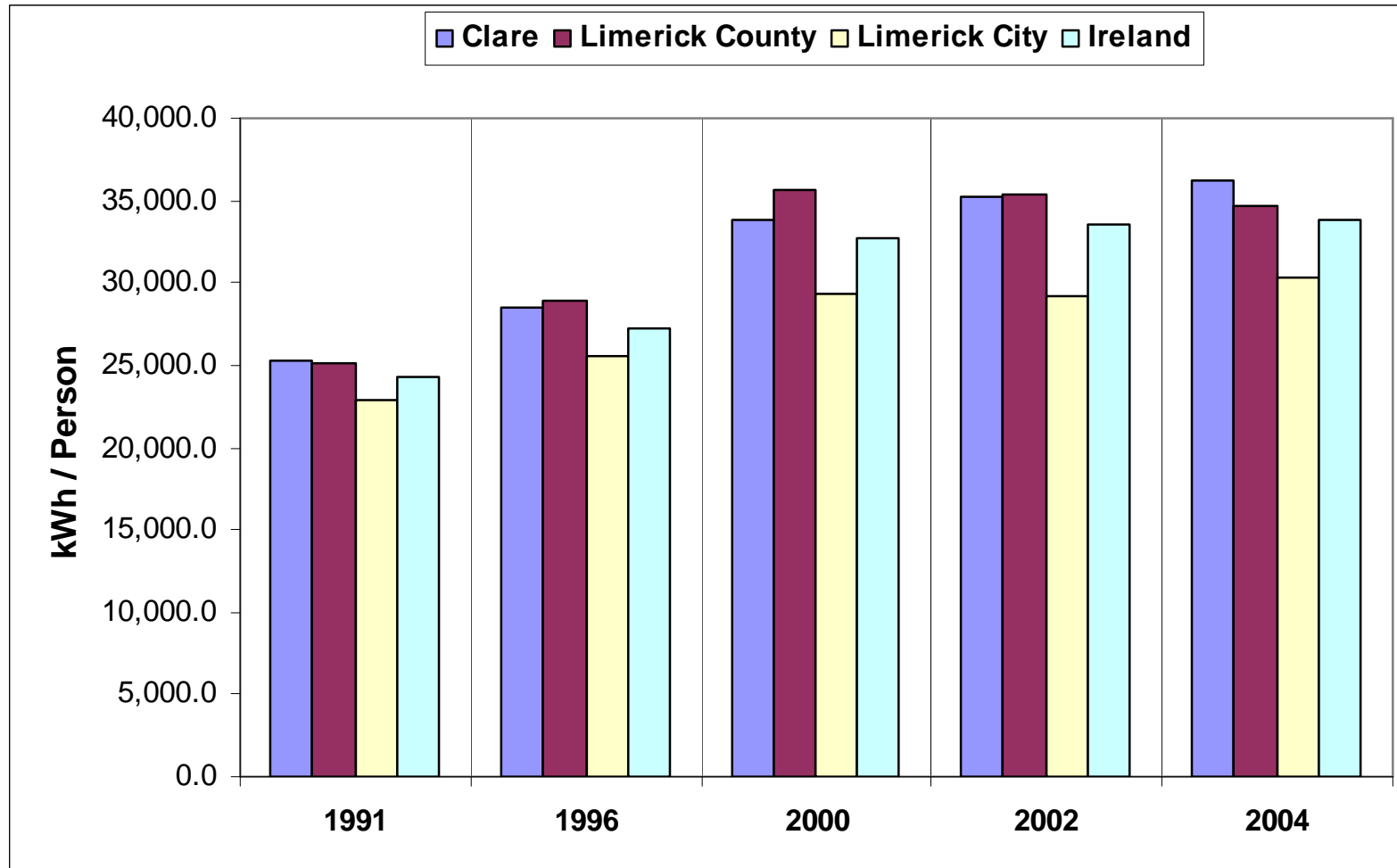


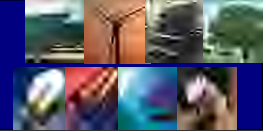
# Study Area – Energy Consumption by Sector



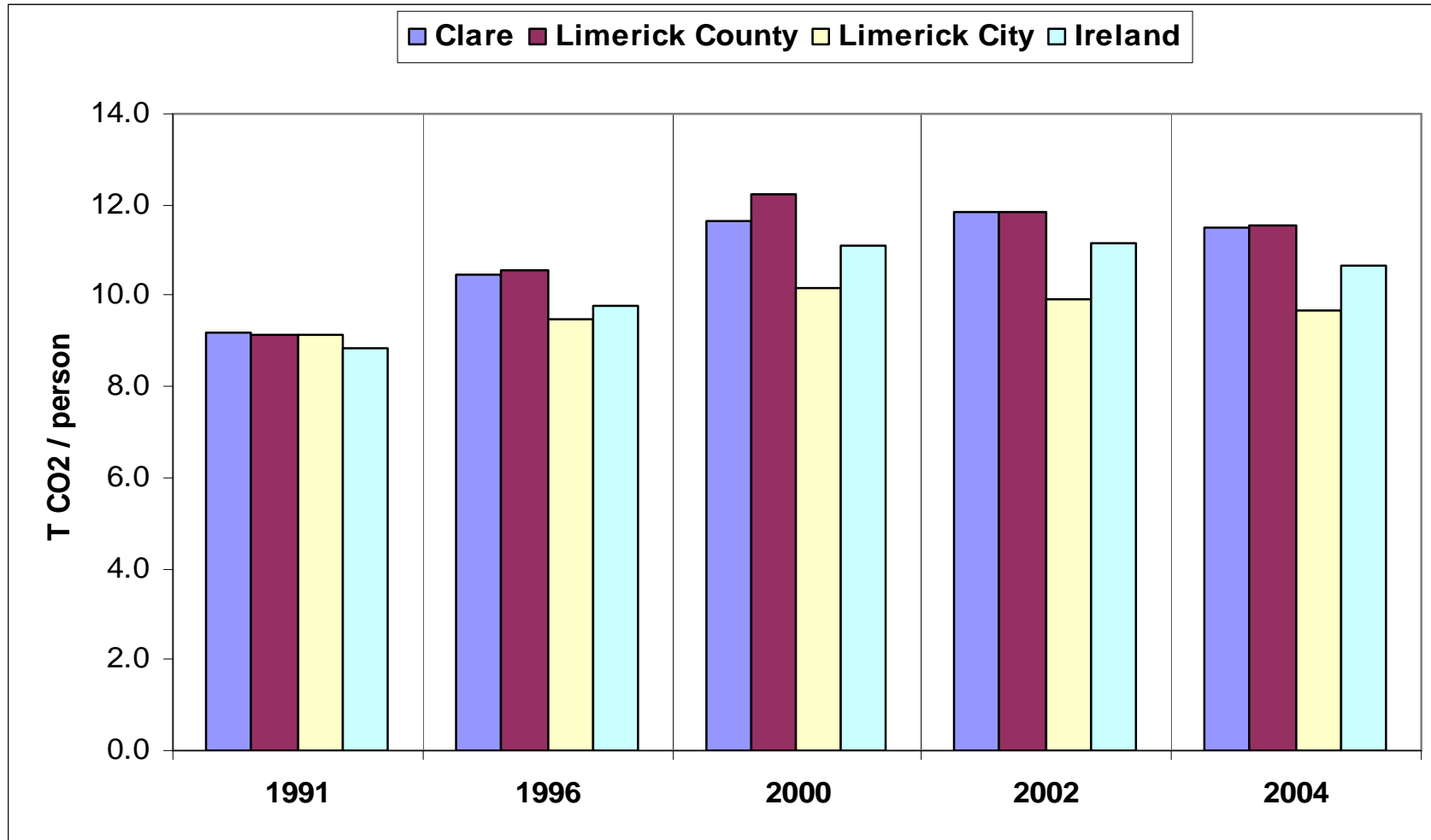


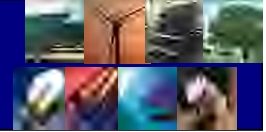
# Energy Consumption per Person





# CO<sub>2</sub> Emissions per Person

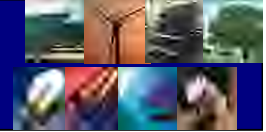




# Clare County – Key Results

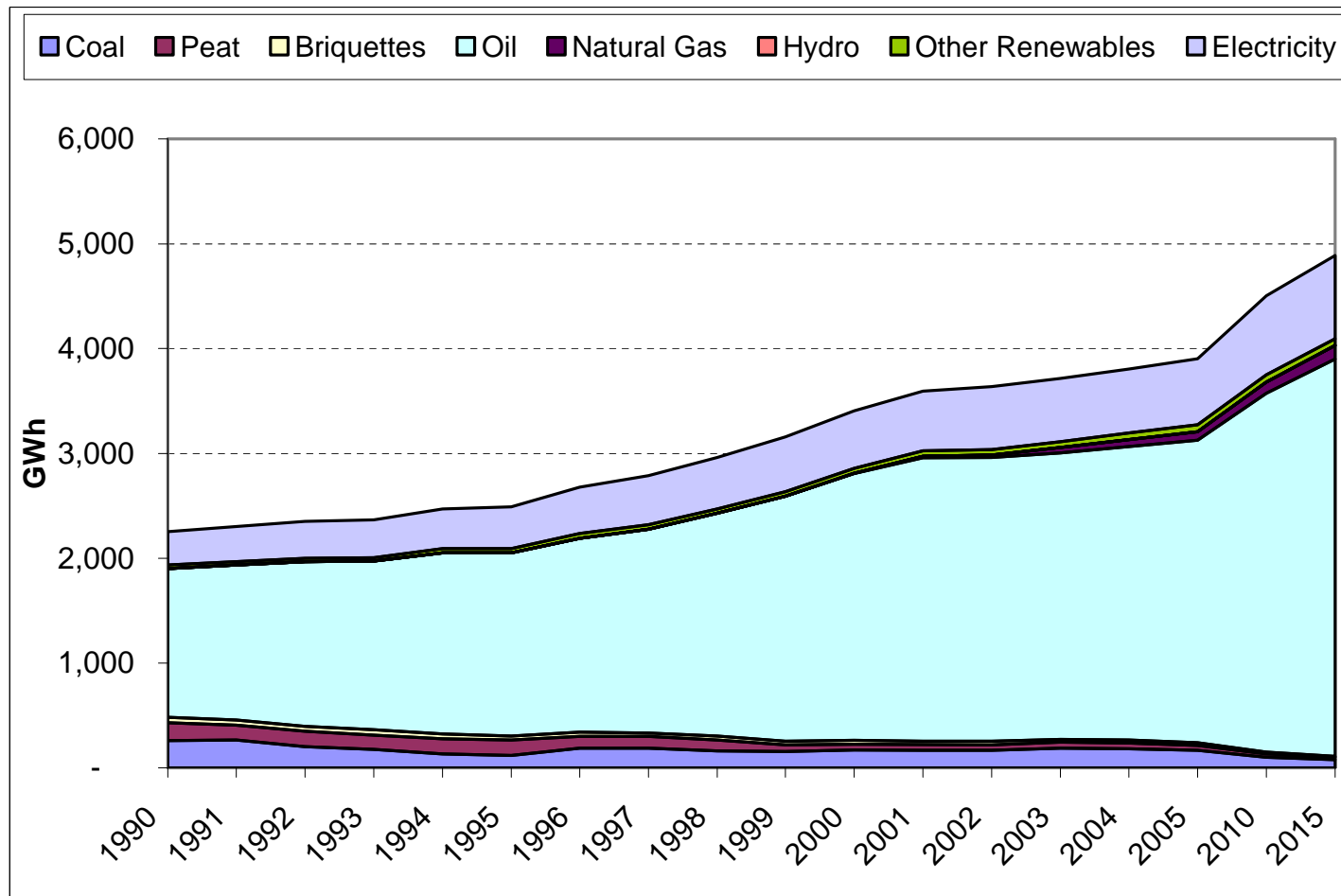
- Energy consumption of 3,800 GWh in 2004
- Energy consumption increase of 65% compared to 1990
- CO<sub>2</sub> Emissions increased by 44% 1,200,000 Tonnes CO<sub>2</sub> in 2004.
- Transport accounted for 40% of Energy Consumption and 28% of emissions in 2004
- Residential Sector accounted for 27% of emissions

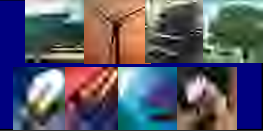




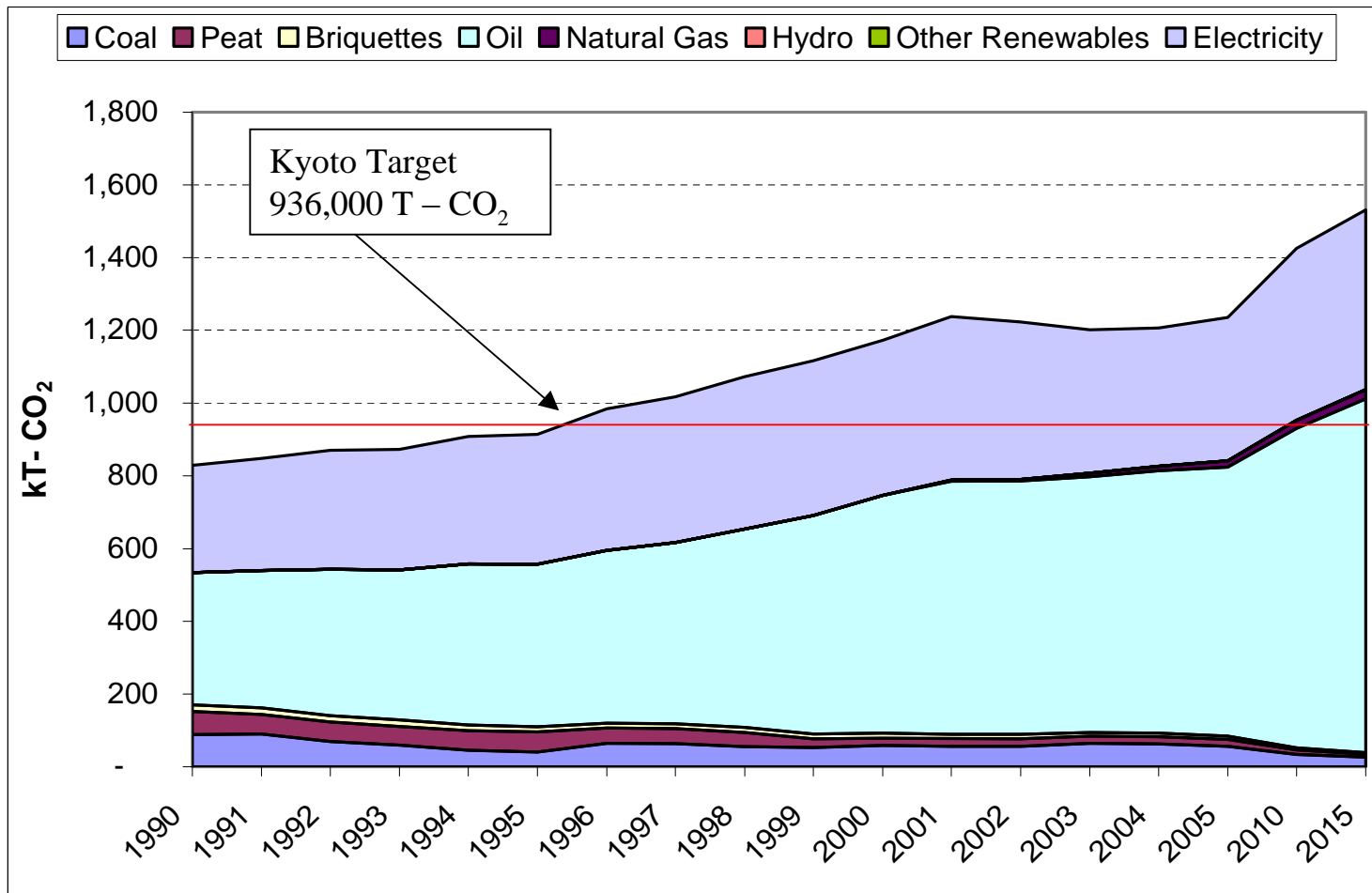
# Clare

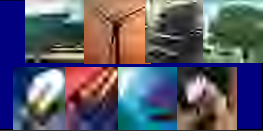
## Energy Consumption by Fuel Trends





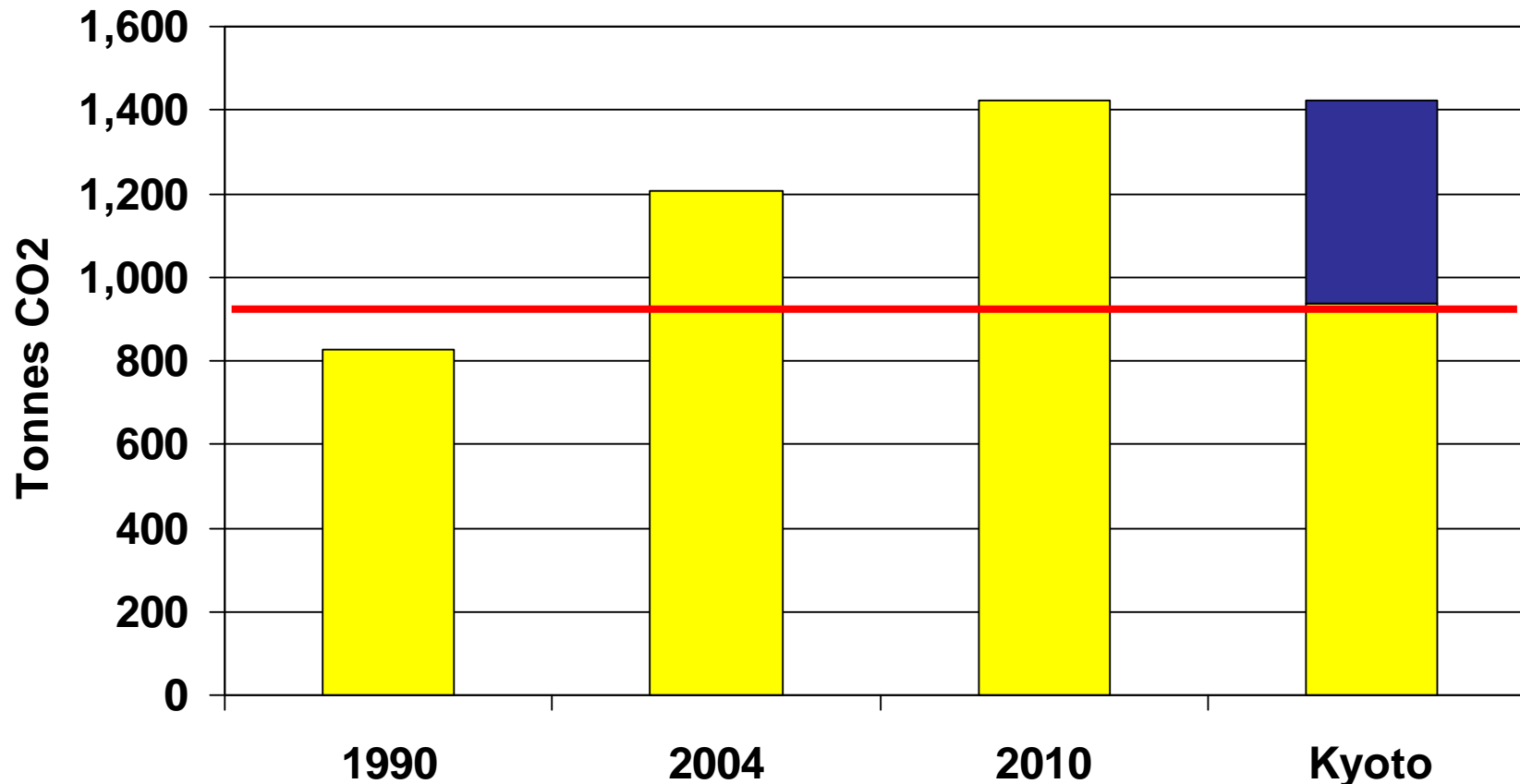
# CO<sub>2</sub> Emissions by Fuel - Clare

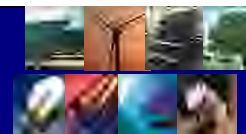




# Clare – the Size of the Problem

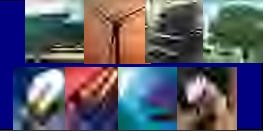
**490,000 Tonnes Above 2010 Kyoto Target  
Potential Carbon Levy of €17m**





# QIRs - Clare

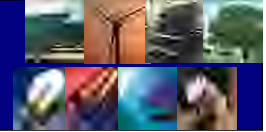
Overall QIRS by sector	Quantified Indicative Reductions Proposed (T-CO <sub>2</sub> )
Energy Production & Supply	188,000
Transport	88,000
Built Environment & Residential	30,000
Industry, Commercial, & Services	72,000
Agriculture	80,000
Waste	28,000
Sinks (Land Use Change & Forestation)	25,000
Total	510,000



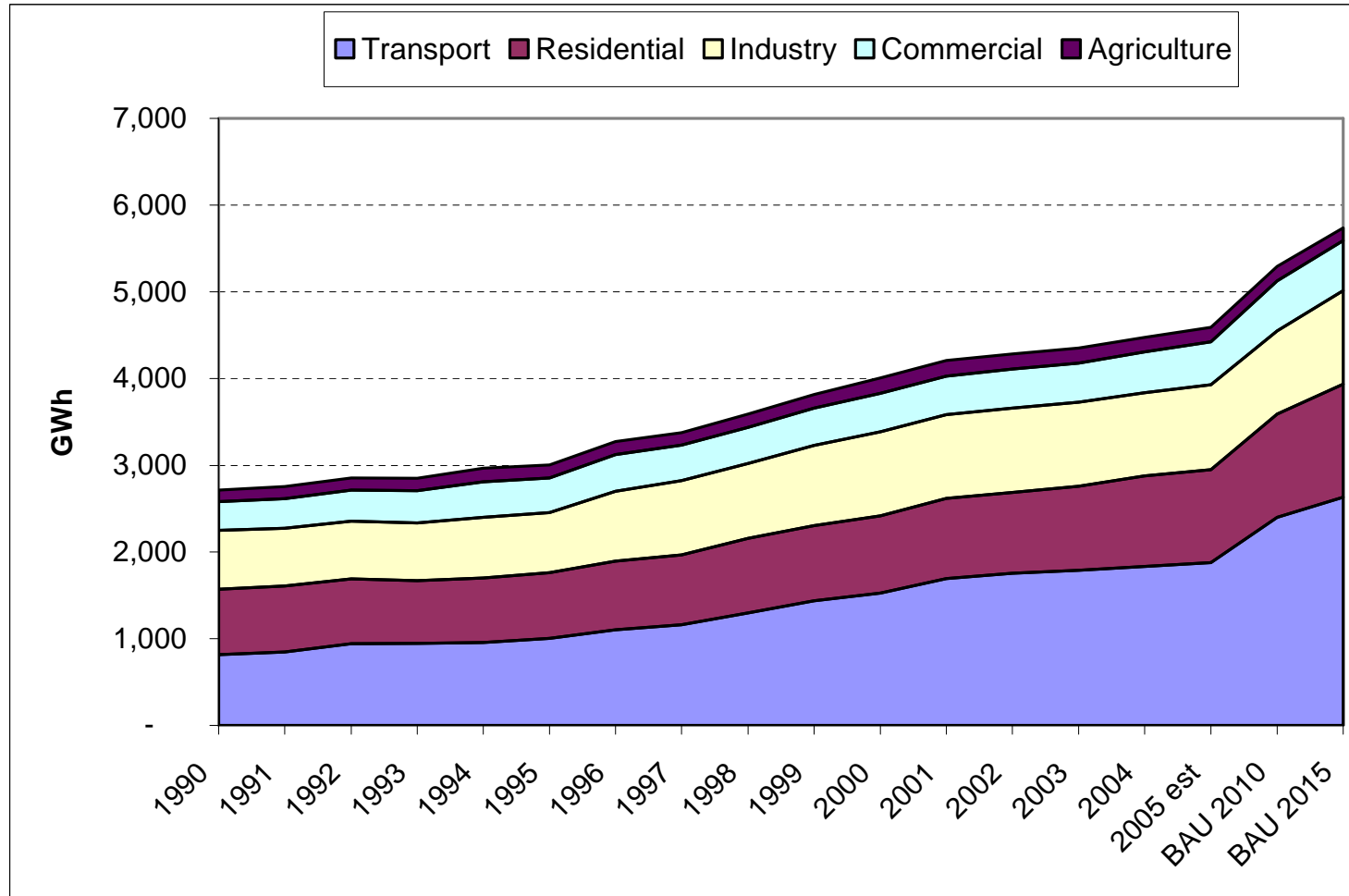
# Limerick County – Key Results

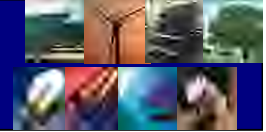
- Energy Consumption of 4,284 GWh in 2004 increase of 56% from 1990
- Electricity accounts for 16% of energy consumption but 30% of emissions
- Energy consumption / GVA & per Capita above national average
- Agricultural sector has low impact in terms of energy related CO<sub>2</sub> emissions



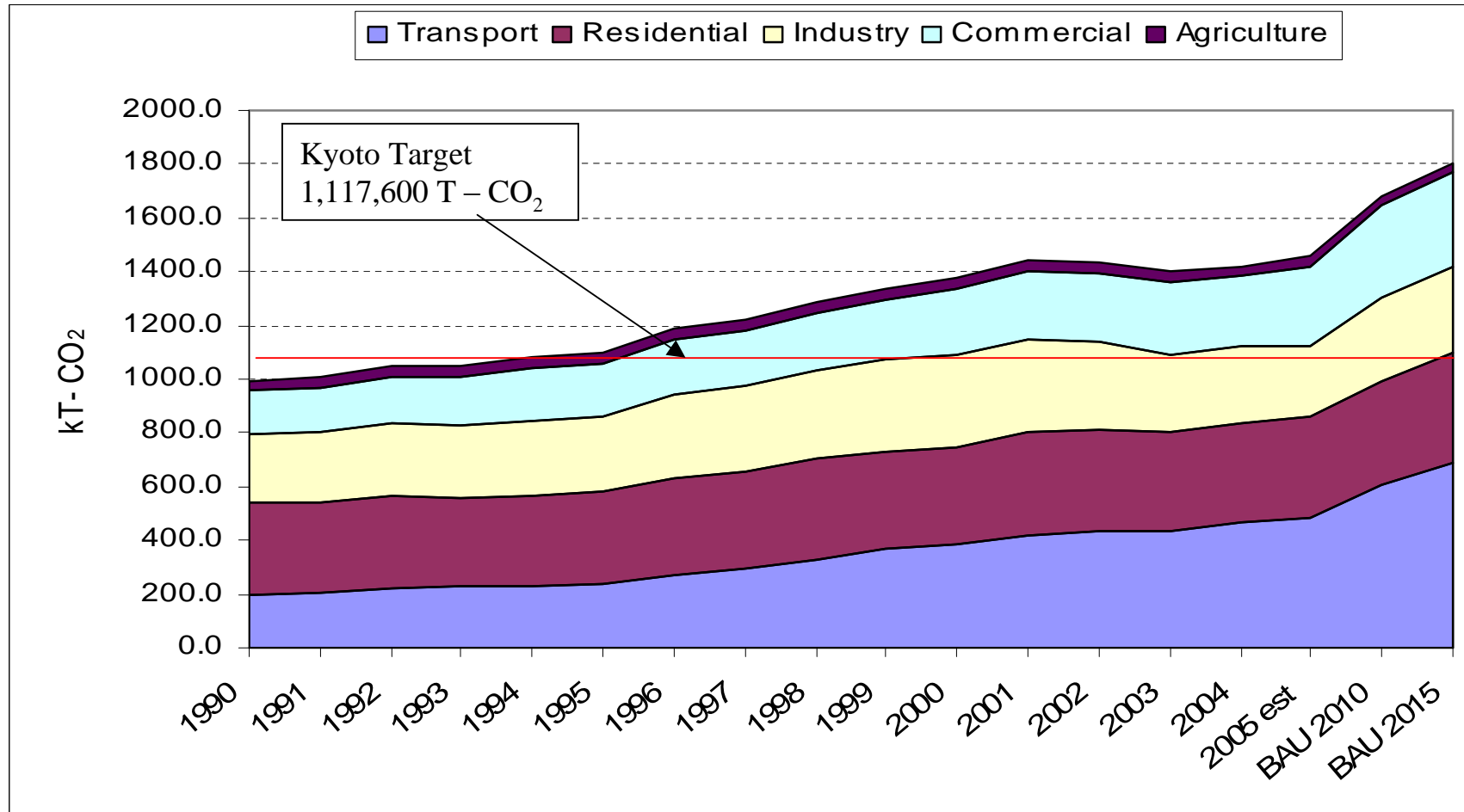


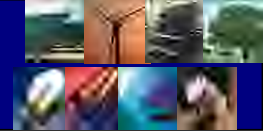
# Energy Consumption by Sector in Co. Limerick





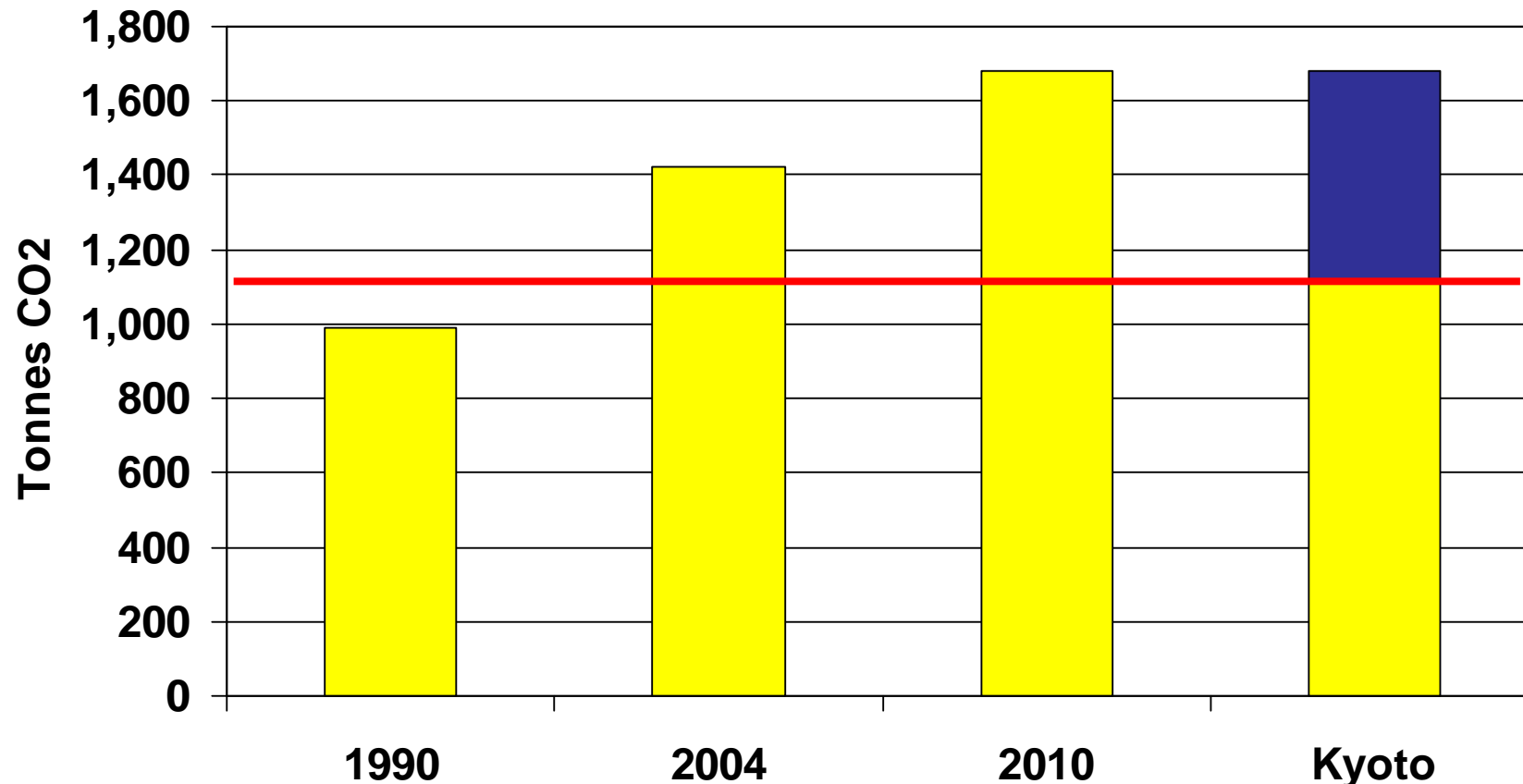
# CO<sub>2</sub> Emissions by Sector – Co. Limerick

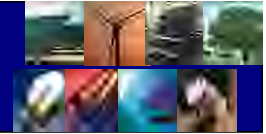




# Co. Limerick – the Size of the Problem

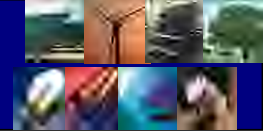
**560,000 Tonnes Above 2010 Kyoto Target  
Potential Carbon Levy of €19.7m**





# QIRs – Co. Limerick

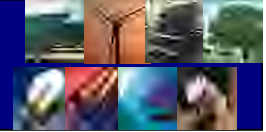
<b>Overall QIRS by sector</b>	<b>Quantified Indicative Reductions Proposed (T-CO<sub>2</sub>)</b>
Energy Production & Supply	215,000
Transport	100,000
Built Environment & Residential	40,000
Industry, Commercial, & Services	83,000
Agriculture	92,000
Waste	32,000
Sinks (Land Use Change & Forestation)	29,000
<b>Total</b>	<b>590,000</b>



# Limerick City – Key Results

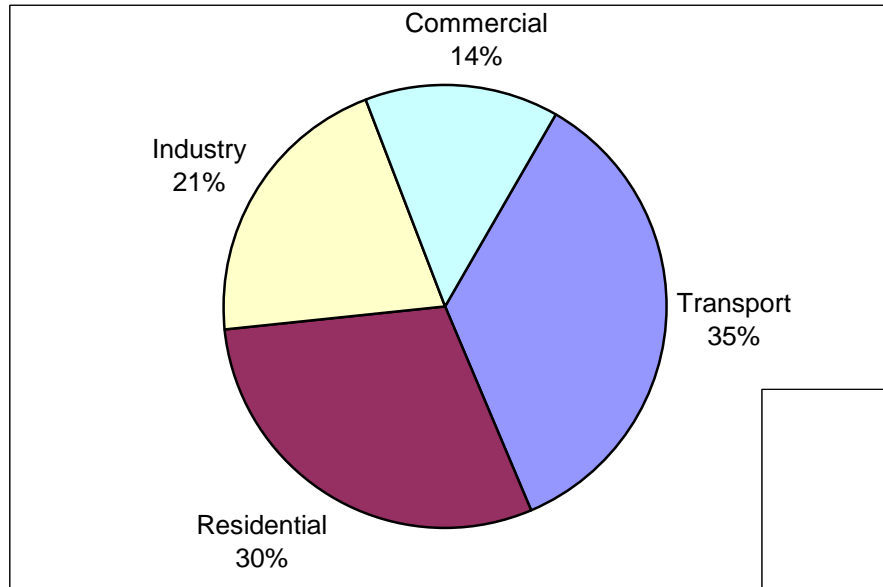
- Energy consumption of 1665.2 GWh in 2004 an increase of 42% since 1990
- Natural Gas accounts for 13% of energy consumption and 8% of CO<sub>2</sub> Emissions
- Energy consumption / capita is below the national average
- Energy consumption / GVA is the lowest in the study area though still exceeding the national average.
- Transport accounted for 35% of Energy Consumption in 2004 the lowest share in the study area





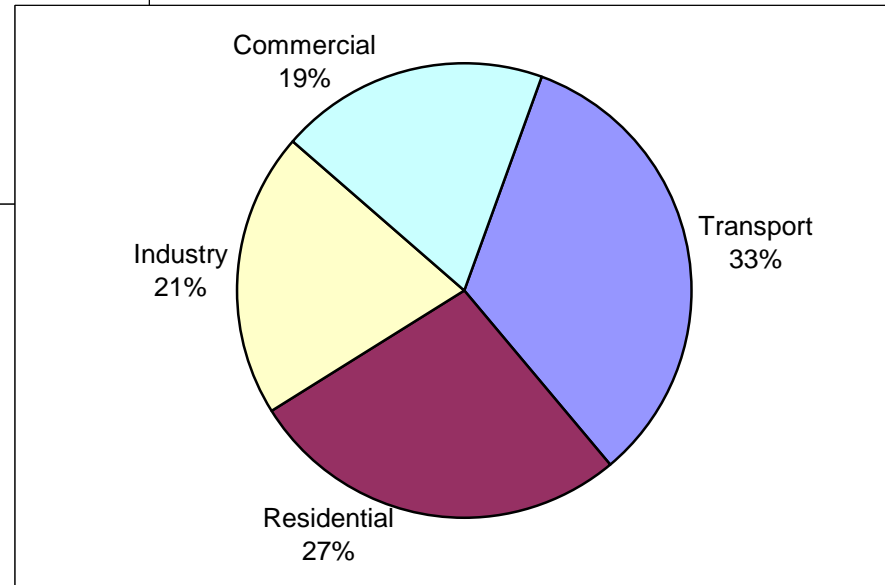
# Limerick City

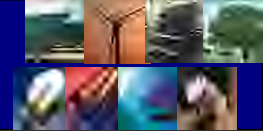
## Energy Consumption/CO<sub>2</sub> by Sector



**Energy  
Consumption  
1665 GWh**

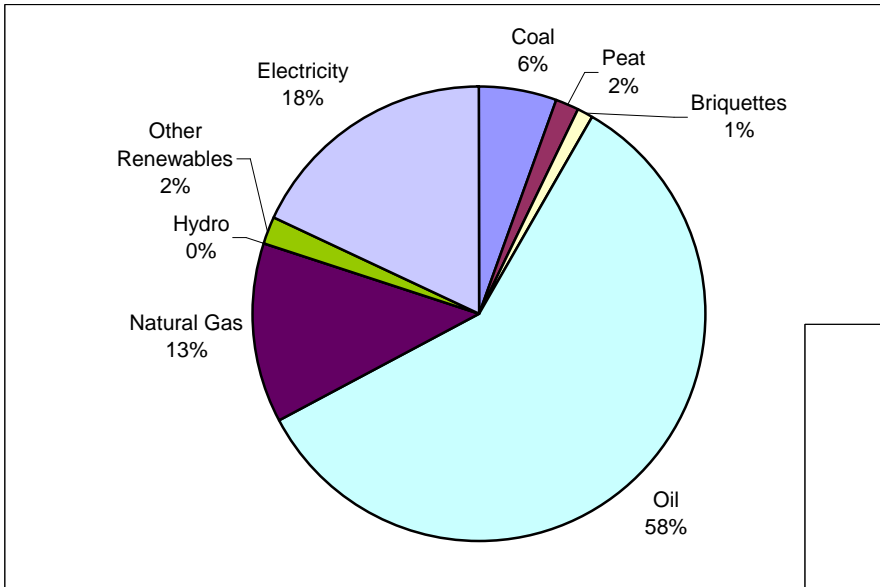
**CO<sub>2</sub> Emissions  
531,000 tons CO<sub>2</sub>**





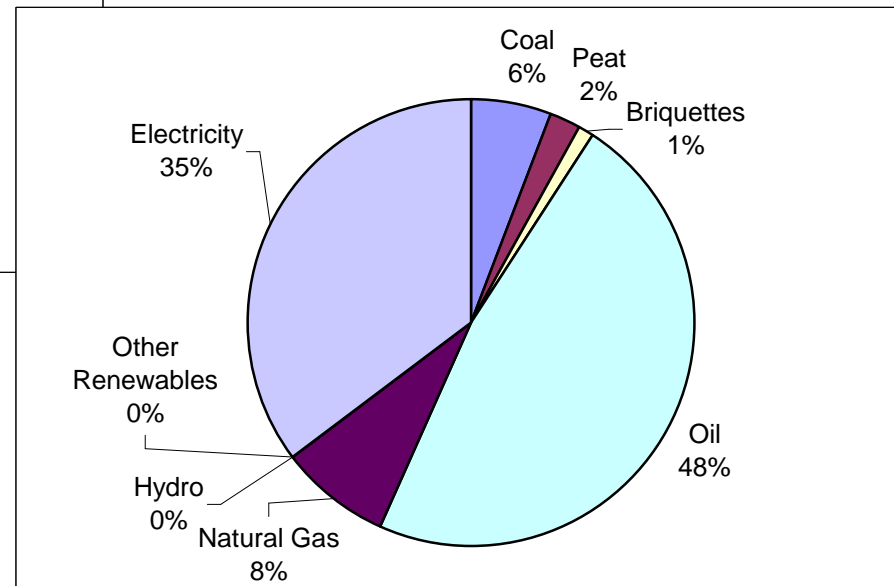
# Limerick City

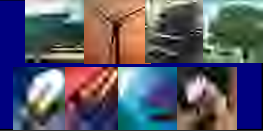
## Energy Consumption/CO<sub>2</sub> by Fuel



**Energy Consumption  
1665 GWh**

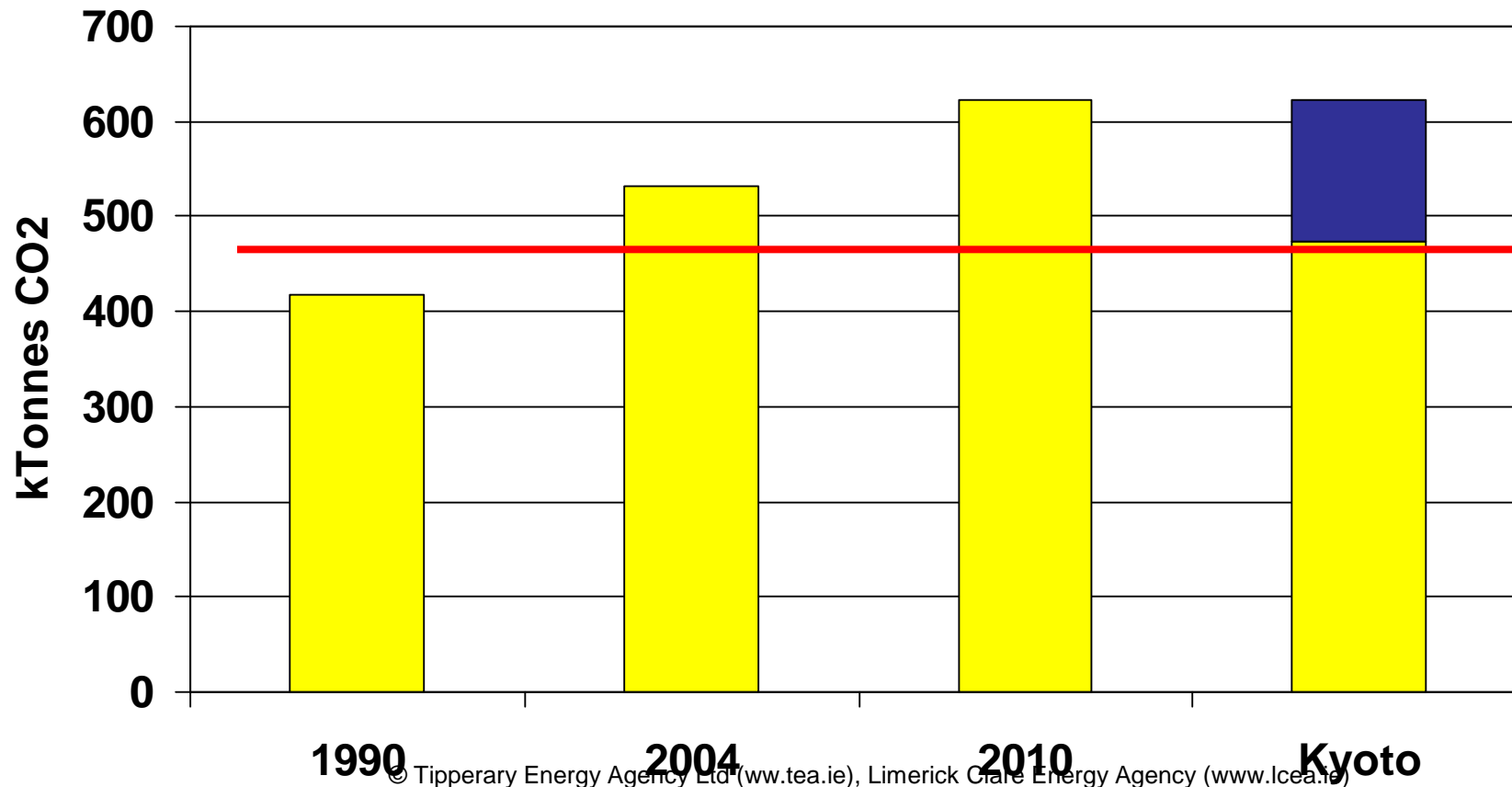
**CO<sub>2</sub> Emissions  
531,000 tons CO<sub>2</sub>**

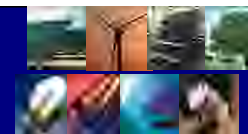




# Limerick City – the Size of the Problem

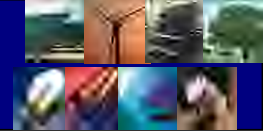
**150,000 Tonnes Above 2010 Kyoto Target  
Potential Carbon Levy of €5.3m**





# QIRs – Limerick City

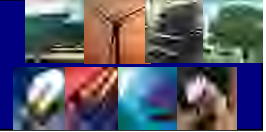
<b>Overall QIRS by sector</b>	<b>Quantified Indicative Reductions Proposed (T-CO<sub>2</sub>)</b>
Energy Production & Supply	60,000
Transport	32,000
Built Environment & Residential	20,000
Industry, Commercial, & Services	30,000
Agriculture	0
Waste	10,000
Sinks (Land Use Change & Forestation)	6,000
<b>Total</b>	<b>160,000</b>



# Conclusions

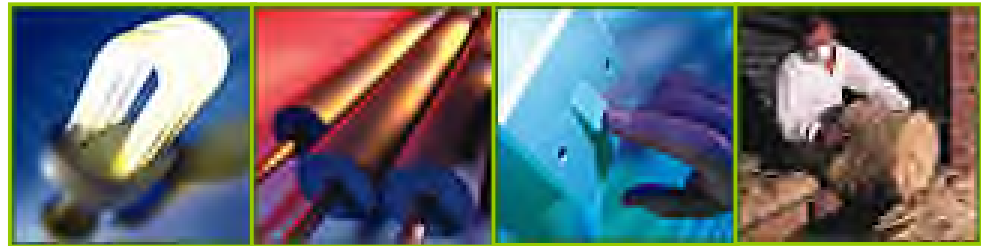
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- All areas in the Study Area will exceed their Kyoto target
- Oil is the predominant Fuel
- Transport has emerged as the dominant sector
- Significant challenges to reach Kyoto and beyond but
- Significant potential for action



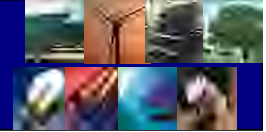
# Individual Responsibility

	Clare	Limerick	Limerick City
<b>Target '000 Tons-CO<sub>2</sub></b>	<b>489.6</b>	<b>562.8</b>	<b>150.8</b>
<b>Target / Person  Tons CO<sub>2</sub></b>	<b>4.7</b>	<b>4.6</b>	<b>2.8</b>



# Thank you.





# Contacts

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- Limerick
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