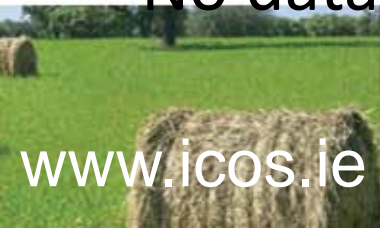




Use of Database

- The computerised database for bovines became fully operational on 1 January 2000.
- Council Regulation 820/97 (later replaced by Regulation 1760/2000)
- Initially paper based only – administered by a private company
- The data is now captured over the Internet, including web services – administered by the Department of Agriculture.
- No database for sheep in Ireland





- Provides general assurances to consumers about the origin and identification of Irish beef;
- Assists in monitoring the health status of bovine animals and the general control of disease;
- Part of the certification process for export markets;
- The pre-clearance of animals prior to entry to the food chain, export, private sale and sale at a mart;
- Marketing of cattle and beef;
- Inspections, including cross-compliance for the Single Payment Scheme (SPS);





- Eligibility and compliance with a number of national schemes including the Animal Welfare Recording and Breeding (AWRB) Scheme for Suckler Herds;
- Calculation of a keeper's nitrogen and phosphorus statement under the Nitrates Directive;
- Central source of statistics on bovines.
- Inspections, including cross-compliance for the Single Payment Scheme (SPS);





Access

- Technology has facilitated access to the database
- Herd owners can now access their herd profile
- Calves can be registered electronically
- The database can be their electronic herd register
- The information supplied to marts includes the export status of the animal on the date of movement into the mart.
- New developments:
 - (a) a web service that will allow approved farm management software packages to interact on a real-time basis with the database and
 - (b) an agent facility that will enable keepers to nominate a third party to access their data and/or carry out certain functions for the herd.





Carbon developments

- Emissions from within ETS must drop 21% by 2020 (vs05).
- Non ETS sectors – 10% (EU 27) under burden sharing
- Ireland's share is -20%
- Under Kyoto Irish agriculture = 17.6M tonnes pa by 2020.
- 2006 agriculture produced 19M tonnes.
- Government plan regarding burden/effort sharing sector cuts ?
- US and G8 now onboard regarding a global deal
- Copenhagen last December failed, Cancun wasn't binding
- South Africa in Dec 11 may be the new Kyoto deal = -30%





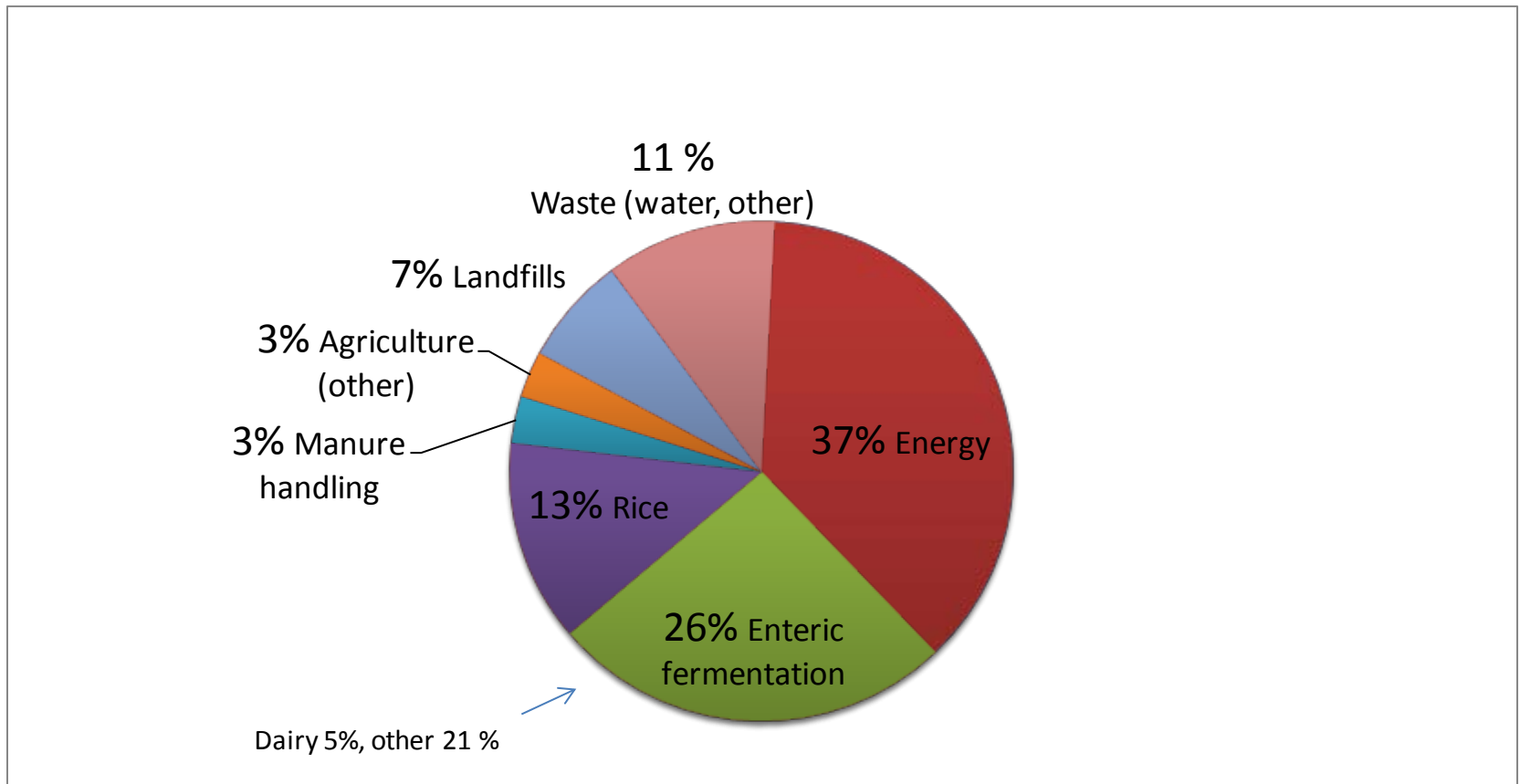
Carbon Bench marking

- Average of top 10 most efficient plants in the EU
- If product deemed sensitive = 100% free allowances based on bench mark production.
- E.g. assume milk powder = 200kg CO₂/tonne avg of top 10 plants
- Plant x = 300kg CO₂/tonne, it must purchase 100kg credits in 2013 and 2020 (if its product covered by the carbon leakage list).
- Plant y = 150kg CO₂/tonne, it can sell 50kgs credits
- Sectors not covered by carbon leakage e.g. cheese as above
- 2013 = 80% of 200kgs = 160 kgs allowances
- 2020 = 30% of 200kgs = 60 kgs allowances



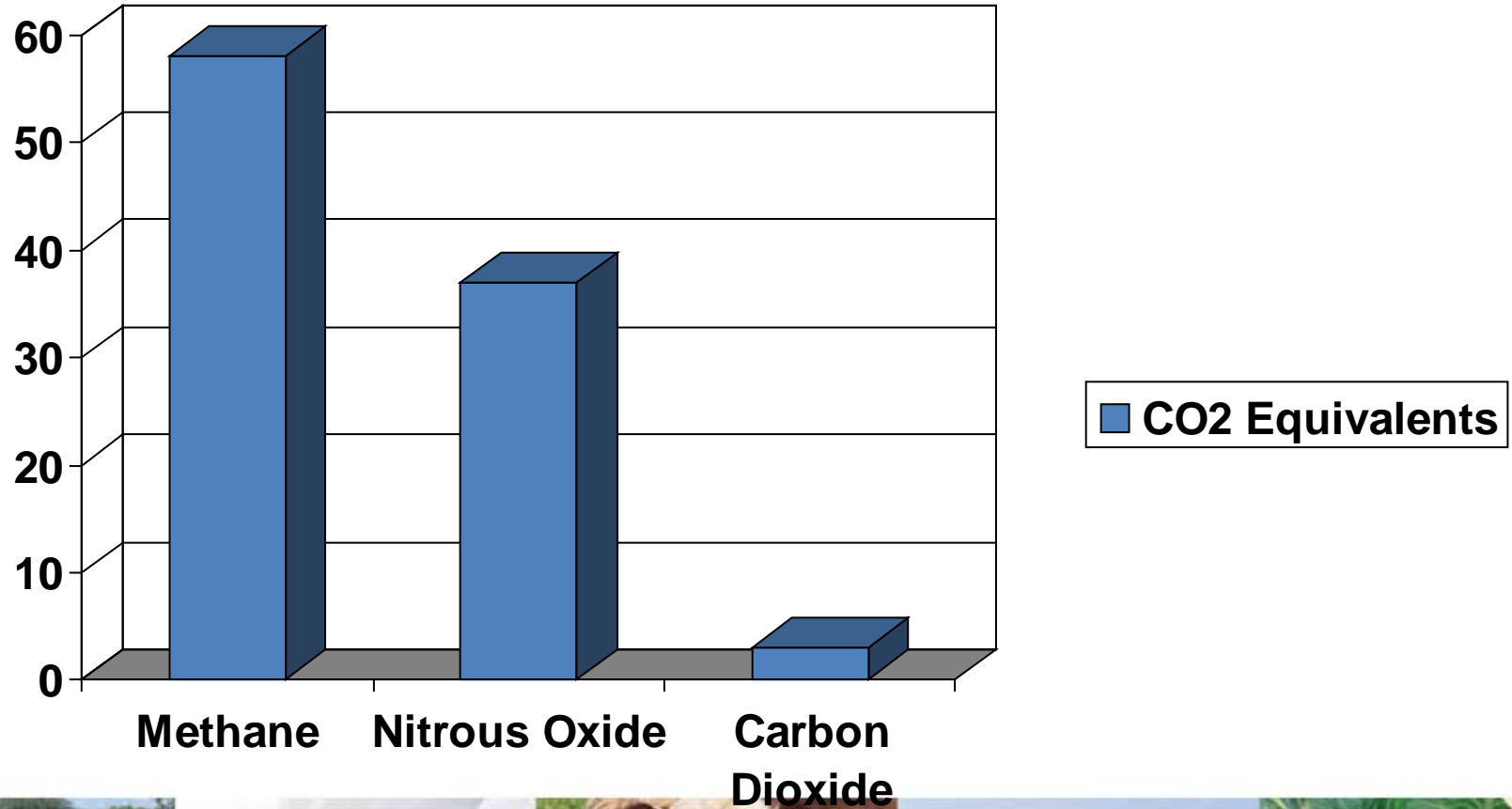


Global sources of methane





Farm emissions (2005)





Impact of Carbon at farm level

- Another quota ?
- Non carbon trading blocks will have big cost advantages over EU producers.
- Added bureaucracy and monitoring at plant and farm levels.
- Possible national herd reduction = impacts directly on input sales and output.
- Volume reduction = cost increases.





Farming type and Carbon

- Biggest emissions = Ruminant herd, but all land has the potential to emit carbon.
- Dairying = 1 to 8 tonnes/ha
- Cereals = 1 to 3 tonnes/ha
- Beef = 1 to 3 tonnes/ha
- Sheep = 1 to 3 tonnes/ha
- CO₂ emissions depends on stocking density and feed intake





Dairying

- Only 1.2% of global GHG emissions are directly related to milk production
- GHG emissions = 0.94 – 1.4 Kg CO₂ eq per litre of milk
- Ireland = 1.3 Kgs/litre = today the potential Carbon bill is € 110 per cow (€121M nationally @ €14/t)
- Figures can vary due to partial inclusion or not of Methane, Nitrous oxide, concentrates, pasture, etc





Beef

- 1 Kg beef produces 10 – 35 Kgs CO₂
- Potential suckler cow carbon tax of € 80 (€88M nationally @ €14/t)
- Grass fed produces more than feedlot
- Older animals = Higher CO₂
- 5% of global GHG attributed to beef production
- Irish production more carbon friendly than south American





Reducing emissions

- Feed additives – can possibly reduce Methane production by 25%
- Nitrification inhibitors can be added to fertilisers
- Reduce fertiliser ?
- Reduce numbers ?
- Offset emissions with sequestration ?
- Current technology will only realise a 3% reduction





Farm Implications ?

- Assume 2011 – 2020 phase in of burden sharing agreement.
- 20% cut in agricultural emissions = - 25% total cattle numbers. Suckler herd -55% (Source : Teagasc)
- 30% cut in agricultural emissions = -37% total cattle numbers. Suckler herd – 84% (Source : Teagasc)
- Another tax/quota on production ?
- Increased compliance checks ?





Carbon in Dairy processing plants

- Processing plants – must be part of ETS (currently if output is 10,000 tonnes + or 20mw input)
- 2013 plants will have to purchase 20% of carbon output (possibly €30 - €80 /tonne)
- 2020 = 70% rising to 100% in 2027
- Currently 13 Co Op owned plants produce 500,000 tonnes CO₂
- EPA controlled via NAP 2
- Exceeding allowances = carbon credits must be purchased (can be sold or banked also)





Large Dairy processor

- 850 M litres, Butter, Skim and casein production
- 90,000 tonnes CO₂ equivalent
- 2013 = 20% of 18,000t @ €25 = €450,000
- 2020 = 70% of 63,000t @ €75 = €4,725,000
- Switching to natural gas, biomass, CHP, wave and wind power as much as possible will minimise future Carbon tax bills.
- Power generation - 100% carbon taxed from 2013 unless from a renewable source





Fonterra

- Fonterra = 0.94 Kgs Co2/litre
- Pastoral Greenhouse Gas Research Consortium (\$15M over 3 years)
- Methane solution 5 – 10 years away
- 85% = On farm emissions
- 10% = Processing/packaging
- 5% = Transport





Industry costs ?

- Est 2013 costs = 10 nz cents/kg milk solids (Fonterra)
- Est 2030 costs = 30 nz cents/kg milk solids (Fonterra)
- NZ Industry costs a possible NZ \$500 M (€230M) by 2030
- Irish direct industry costs ? (€77M?)





Possible Opportunities

- Land use will become more focussed on carbon
- Global deals will provide for the carbon leakage issue.
- Commission has considered casein, lactose and skim as at risk of carbon leakage
- Energy industry could become integrated within the food industry.
- Future technology will mitigate carbon outputs thereby easing the possible reduction in the national herd.
- Carbon capture projects will present future business for Co Op and farmer alike.





FAO – GHG emissions from the dairy sector





Global dairy emissions

- 2007 = almost 2 B tonnes CO₂ to produce 550 million tonnes of dairy produce
- Globally dairy = 4% GHG
- Average global milk emissions = 2.4 CO₂ kg eq per kg of FPCM (grass = 2.7, stall = 1.8)
- Regional grass variation 1.3 to 7.5Kg CO₂ eq per kg of FPCM
- Developing countries = double the developed world's output





- Grassland systems almost double stall fed and account for almost 60% of global dairy emissions
- Developed countries pre farm gate emissions = 80 - 85% of total emissions
- Big problem is reducing emissions through mitigation (-4%)
- Emissions unlikely to fall as population and consumption is rising
- Beef from the dairy herd = 57% total global beef meat production





- European figure for LULUC estimated at only 0.09 kg CO₂ eq per kg FPCM
- Land use change = biggest contributor globally e.g. deforestation for soya production. Brazil = 37 t/ha (7.7 kg CO₂/kg soy), Argentina = 17 t/ha
- Post farm gate emissions vary between 0.06 and 0.23kg per kg FPCM





EU CO₂ emissions – farm gate to retail

•		kg CO ₂ /kg
•		milk
•	Transport farm to plant	0.016
•	Processing	0.086
•	Packaging	0.038
•	Transport dairy to retail	0.014
•	Total	0.155





GHG – Dairy products (farm to retail)

- Fresh milk and cream 0.153
- Fermented milk and cream 0.304
- Cheese and whey 0.126
- Skimmed milk powder 0.157
- Whole milk powder 0.171





CO₂ mitigation possibilities

- 10% increase in digestibility decreases GHG by 14.8%
- Assuming milk production increases in tandem with digestibility then a 10% increase in digestibility = -19.2% in grassland and -15.4% in stall fed systems.
- Combined production of meat and milk will result in low GHG per unit of product, meat or milk
- Grassland systems – possible methane reduction techniques will yield greatest savings
- Natural grasslands = 70% worlds agric lands and improving management = possible -1.5B tonnes saved (IPCC 2007)





Mitigation continued

- Increasing starch and decreasing fibre
- Increasing forage quality = reduced methane
- Feed additives – e.g. Romensin etc, but banned in EU as they are deemed antibiotics
- N_2O = fertiliser, but linked to excess N on land or in diet.
- Anaerobic digestion of slurry = decreased NO_2





Ireland versus competition

- Ireland has efficient grass growth and production
- Product mix of cheese and butter is carbon efficient use for milk
- Negatives are forage based and long winters on silage
- Dutch, Danish, USA etc are intensive systems that can demonstrate lower carbon footprints
- Irish processing energy costs are expensive in real terms and in carbon
- 50% of NZ energy from Hydro electricity = cheap, clean power





ICOS Priorities

- ICOS has lobbied for carbon leakage designation for the Irish Dairy industry
- Casein, skim and lactose now included
- ETS must allow for consolidation of plants
- All € must stay in Ireland and no clawback to 3rd countries
- All carbon € raised must stay in the agricultural sector for direct re-investment
- Carbon produced within food production should be viewed differently.

