Agriculture – We Photosynthesize!

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Research & Value Added
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Who is the OWGL

- Trade Association representing – Wheat, Barley, Rye, Triticale, Canola & Mustard Producers;
- Established in 1926;
- Headquartered in Pendleton, Oregon;
- Serving more than 4,000 producers/land owners throughout the State

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Who am I and Why am I here?

- I am a producer from Umatilla County;
- I serve as the Chairman of the Research & Value Added Committee for the OWGL;
- I have a very deep concern that the goals of policymakers are outpacing science with respect to “Climate Change” legislation!
- Production Agriculture Needs the expertise of ARS.

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Background – 2004 Oregon Greenhouse Gas Emissions

In 2004, Oregon's greenhouse gas (GHG) emissions were 67.5 million metric tons of carbon dioxide equivalent43 (MMTCO2e).44 That was about one percent of greenhouse gas emissions for the United States as a whole, which were roughly 7.1 billion metric tons CO2e. Greenhouse gas emissions increased by 12 million metric tons from 1990 levels by 2004, which is a 22 percent increase over Oregon's 1990 greenhouse gas emissions of 55.5 million metric tons of CO2e. This compares with a 16 percent increase for the United States. Figure 11 shows the change in emissions for different greenhouse gases between 1990 and 2004.

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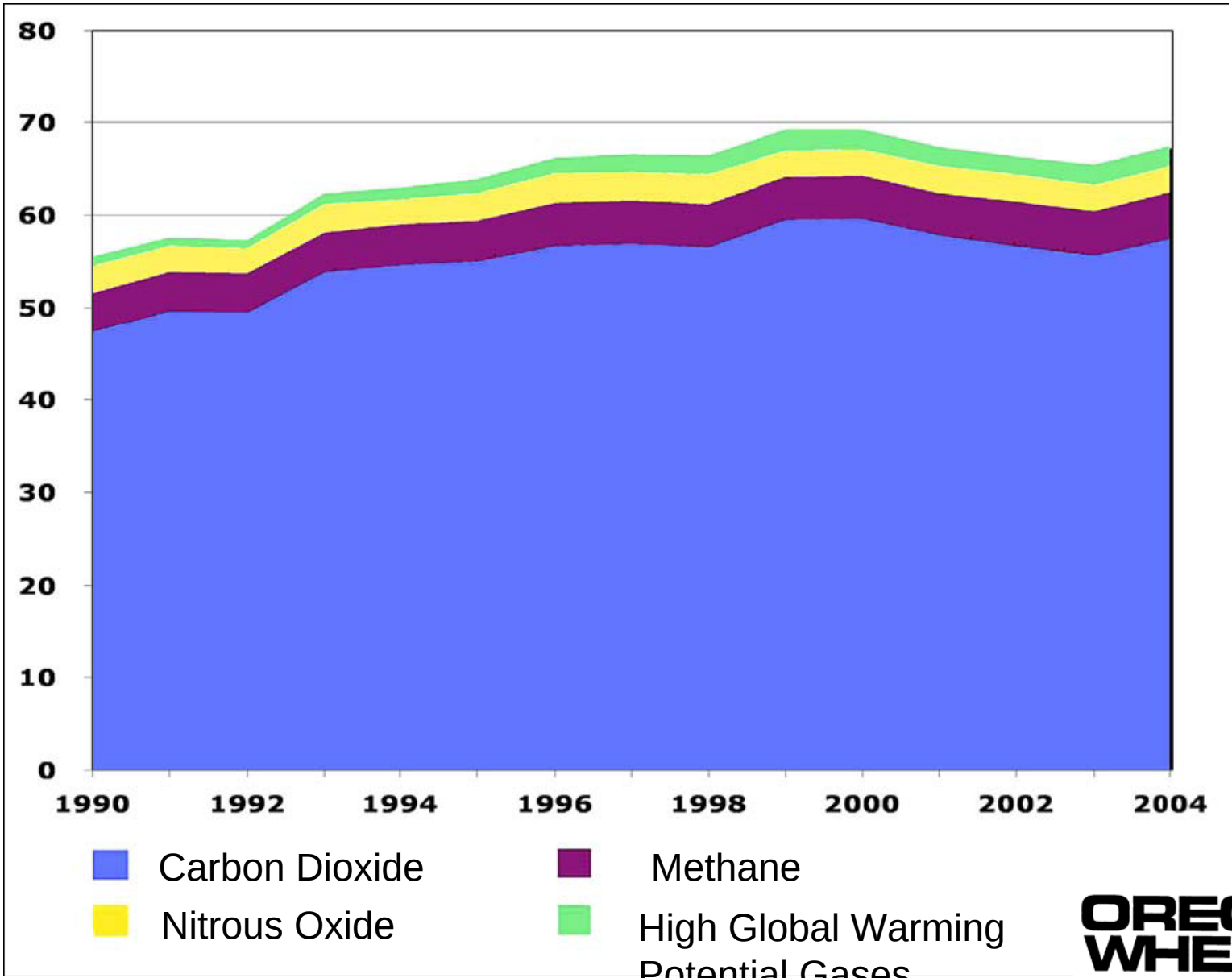
Figure 11: Oregon Greenhouse Gas Emissions 1990-2004



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Oregon's Governor Appointed a Climate Change Integration Group

- To develop a framework for making choices;
- The CCIG was asked to create a preparation & adaptation strategy for Oregon;
- Implement & Monitor mitigation measures from the 2004 Oregon Strategy for Greenhouse Gas Reductions (and create new measures);
- Serve as a clearinghouse for Oregon climate change information; and
- Explore new research possibilities related to Climate Change.

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CCIG KEY RECOMMENDATIONS

Much information about climate change already exists that can be acted upon in rapid order. For example, we know that there are ample opportunities to increase energy efficiency in buildings. Capturing these savings would reduce emissions and produce cost savings. Water conservation can be increased among municipal, industrial and agricultural users. Efforts here would reduce the long-term costs of water procurement and management. Many other examples of readily available information exist that could be rapidly deployed to reduce emissions and prepare for climate change.

In this spirit, the CCIG recommends that Oregon move forward with the following key actions for addressing climate change. The Governor, the Legislature, the new Global Warming Commission, and state agencies should place these recommendations as one of their highest priorities. These recommendations fall within ten key themes:

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Climate Change Integration Group Key Recommendations:

1. Immediately Begin Preparing for Climate Change;
2. Act Now to Expand, Enhance, and Reinvigorate Mitigation Efforts;
3. Determine How Climate Change Will Affect Oregon's Diverse Regions;
4. Assist Oregon Institutions and Individuals in Responding to Climate Change;
5. Develop and Implement an Education and Outreach Program;

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Key Recommendations (cont.)

6. Transform Our Planning Processes to Deal with Climate Change;
7. View Responding to Climate Change as an Economic Development Opportunity;
8. Incorporate the Public Health Implications of Climate Change;
9. Continue to Develop and Refine a Climate Change Research Agenda for Oregon;
10. Provide Funding for Key Action Areas Identified in this Report.

**the full report is available at:*

www.oregon.gove/ENERGY/GBLWRM/CCIG.shtml

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1. IMMEDIATELY BEGIN PREPARING FOR CLIMATE CHANGE

Even if greenhouse gas emissions are rapidly reduced, the long time scales of the Earth's ocean systems will cause global temperatures and sea levels to continue to rise over the next century. Oregon, like many regions of the world, is vulnerable to the effects of global climate change, which makes it imperative for the state to rapidly prepare for the coming effects of warming. Planning now for a different and uncertain future can benefit the present in many ways. Thinking strategically now about future risks posed by climate change can reduce those risks and also produce future benefits, for example, by building infrastructure such as expanding water supply or storm treatment facilities now rather than more expensively in the future.

➔ Prioritize increasing resiliency within Oregon's natural, built, human and economic systems before major impacts occur.
➔ Require and encourage all government agencies to adopt and implement climate change preparation plans.
➔ Assess existing capacity and develop governance systems appropriate for the rate and scale of change that will accompany climate change.
➔ Assess existing finance mechanisms and develop new funding options as needed to account for the longer time frames required to effectively prepare for climate change.
➔ Limit non-climate stresses on Oregon's natural, built, human and economic systems.

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2. ACT NOW TO EXPAND, ENHANCE, AND REINVIGORATE MITIGATION EFFORTS

To address climate change, Oregon must move towards a largely carbon-free economy. In order to meet the State's 2020 emissions goal, we must reduce emissions by 42 percent from forecasted business-as-usual levels (see Figure 1). Since electricity and transportation are the largest sources of our state's emissions, this means we need a dramatic increase in the rate at which we implement energy efficiency and non-carbon-based energy sources, and to develop a less carbon-intensive transportation system. This report will later show that it appears that Oregon is on its way to stabilizing greenhouse gas emissions by the year 2010, the first of the State's greenhouse gas goals. However, the actions that have been put in place, as well as those that are in progress, will only achieve about one half of the necessary reductions to meet the 2020 goal. We have made significant progress, but much remains to be done.

➔ Enact a cap and trade regime for greenhouse gas emissions, in concert with other states and provinces in the Western Climate Initiative.
➔ Ensure that energy efficiency goals articulated in the 2004 *Oregon Strategy* are met.
➔ Take action to ensure that the tailpipe emissions standards adopted by the State can go into effect.6
➔ Take action to transform our transportation and land use planning processes to reduce greenhouse gas emissions.

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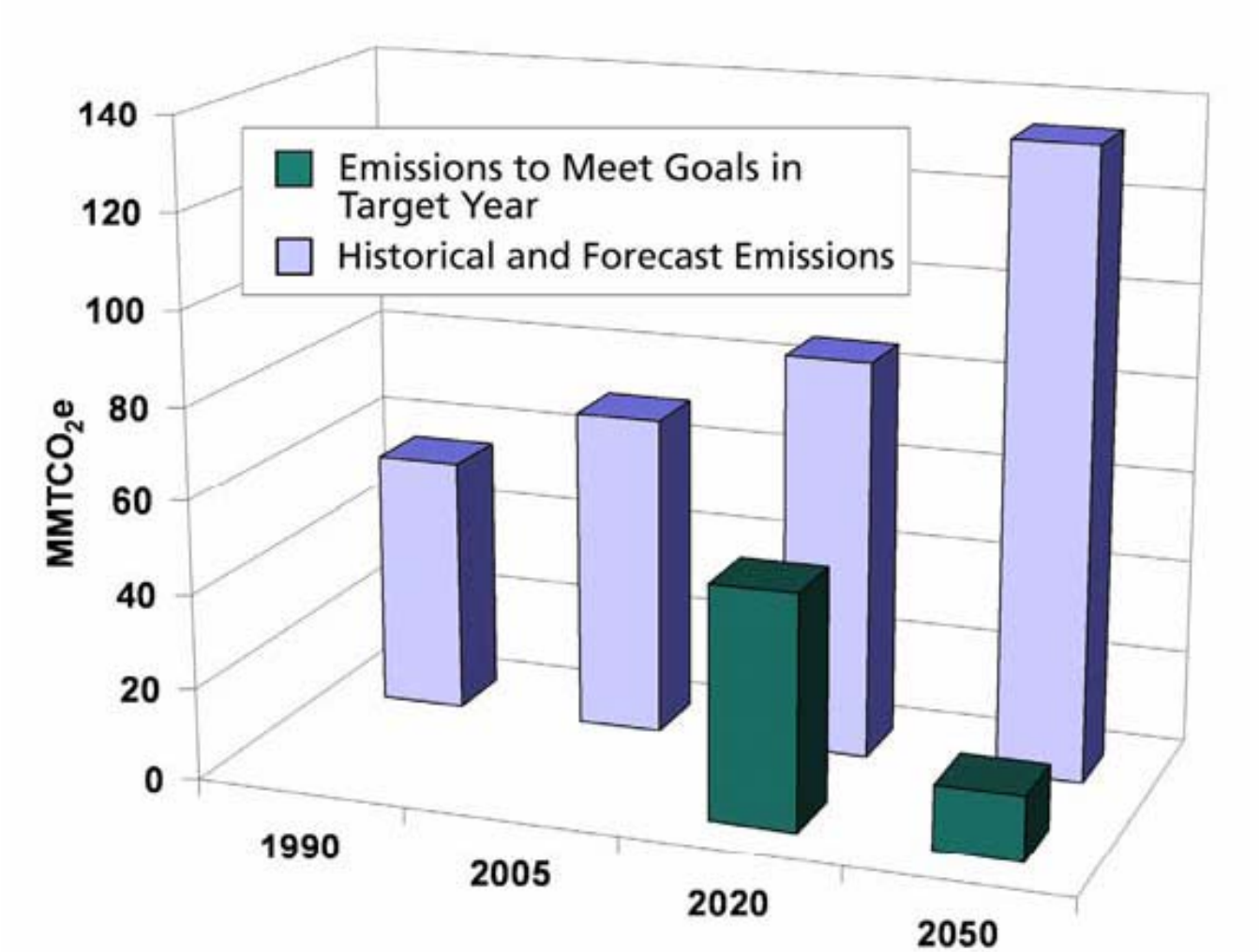
Figure 1: Emission Goals Relative to Forecasted Emissions



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3. DETERMINE HOW CLIMATE CHANGE WILL AFFECT OREGON'S DIVERSE REGIONS

Although we already have useful information that can be acted upon, additional information in the hands of decision-makers is essential if we are to successfully address climate change. We must collect new information and develop new analytic tools in order to most effectively enact a response. Localized climate projections for the various regions within Oregon must be developed, and these localized assessments are essential for both the public and private sectors to respond to climate change. Information, practical research, analytical tools, and analyses must focus on helping Oregonians understand their potential contributions to mitigation, as well as to understand the pressures that a changing climate will place on them and the actions that they can take to prepare for and adapt to climate change.

➔ Develop localized climate change assessments that focus on impacts of a changing climate, adaptation and preparation needs, and mitigation opportunities.

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4. ASSIST OREGON INSTITUTIONS AND INDIVIDUALS IN RESPONDING TO CLIMATE CHANGE

Oregon needs to develop the institutional infrastructure to provide actionable information to help Oregon's institutions and individuals understand and act on the opportunities for both mitigation of and adaptation and preparation for climate change. Most public and private entities and households do not currently have the capacity or the expertise to complete vulnerability assessments or develop preparation policies and plans. Nor do existing academic, government, non-profit or private research, monitoring, or decision-making bodies currently have the capacity to plan, prepare or respond effectively to climate change. Recent flooding in the Northwest again has demonstrated how difficult it is to plan "outside the box."

➔ Lead by example by integrating systems-based planning for mitigation, adaptation, and preparation into state agencies' long-range processes that affect the development of physical infrastructure.
➔ Support integrated local government planning for both greenhouse gas mitigation and climate change preparation and adaptation.
➔ Develop the support and information infrastructure necessary for assisting business and industry in Oregon with climate change preparation and adaptation planning.

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5. DEVELOP AND IMPLEMENT AN EDUCATION AND OUTREACH PROGRAM

The Climate Change Integration Group was charged with the development of a climate change information and outreach plan. However, due to the interim nature of the CCIG, CCIG members believe it is best suited to provide the Global Warming Commission with a general roadmap for education and outreach. The Commission, as the permanent stakeholder body, will pick up the ongoing coordination of global warming policies and activities in the state and be responsible for designing its outreach and education program.

➔ Develop and implement a coordinated education and outreach program that will help increase public awareness of climate change impacts, strategies and benefits.

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6. TRANSFORM OUR PLANNING PROCESSES TO DEAL WITH CLIMATE CHANGE

At all levels of government, we need to 1) consider climate change as a key element in our current planning processes; 2) modify our planning processes so that we conduct them on a holistic basis that considers multiple interconnected systems – as well as mitigation, adaptation, and preparation – simultaneously; and 3) develop dynamic planning processes that are designed to handle changing rather than stable conditions, and that continually observe, understand, and adapt to change. It is especially important that we enact these changes for transportation and land use planning, as decisions in these arenas have significant impacts on energy use, emissions, and the robustness of infrastructure.

➔ Ask that the “Big Look” Task Force explicitly address climate change as a core issue in
land-use planning.
➔ Incorporate climate change effects and impacts into new transportation initiatives.
➔ Redesign planning tools to account for the future impacts of climate change.
➔ Use and continually improve adaptive management processes and contingency planning.
➔ Plan at larger scales to ensure that climate preparation in one sector or region does not affect preparation elsewhere.

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7. VIEW RESPONDING TO CLIMATE CHANGE AS AN ECONOMIC DEVELOPMENT OPPORTUNITY

Responding to climate change will cause large amounts of capital to flow into both low-carbon technology and adaptation technology. Oregon should view this transition as an economic development opportunity. By choosing to act now, Oregon can create a business environment that stimulates and supports both mitigation and adaptation technologies. As early adopters, Oregon businesses can earn critical early market share. This can drive economic growth in the state and will establish a foundation for exporting both products and expertise to other states and the rest of the world. Oregon is well-suited to assume a leadership position in this transformation in our economy. The state has a long history of a conservation ethic and its public and private institutions are well-known for its leading edge work on sustainability.

➔ Build on the state's leadership in carbon offsets resulting from the Oregon Carbon Dioxide Standard, the nation's first greenhouse gas mitigation legislation.
➔ Build on Oregon's experience with managing forests by ensuring that forest carbon sequestration is acknowledged in state, regional, and national climate policy.
➔ Build on Oregon's leadership in green building by ensuring that a whole buildings perspective is accommodated by state, regional, and national climate policies.
➔ Link climate preparation to the existing economy and to new economic development efforts.

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8. INCORPORATE THE PUBLIC HEALTH IMPLICATIONS OF CLIMATE CHANGE

The impacts and implications of climate change on public health have been noticeably lacking in local, state, and federal policy on climate change to date. Given the potential magnitude of these issues, the prior inattention to this important area should be remedied in future policy.

➔ Integrate the public health impacts of climate change into the policy, planning, and preparation for climate change done by the Global Warming Commission, the state, and the research sector.
➔ Recognize and incorporate the benefits to public health of many climate change mitigation, preparation, and adaptation activities.
➔ Watch for unintended public health consequences of climate change mitigation, adaptation, and preparation activities.

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9. CONTINUE TO DEVELOP AND REFINE A CLIMATE CHANGE RESEARCH AGENDA FOR OREGON

The CCIG has endeavored to develop suggestions for a research agenda on climate change for the Oregon University System and, to a lesser degree, for state agencies and the private sector. Research is a vital component of the framework Oregon needs to develop to assist individuals, businesses and governments to incorporate climate change into their planning processes. In addition, it is now clear that equal attention has to be given to the human dimension of climate change processes. It is clear that the newly created Oregon Climate Change Research Institute (OCCRI) must work with the new Global Warming Commission to address research needs.

➔ Create a Climate Change Research Working Group to advise the OCCRI so it can design and conduct a workshop of university researchers alongside business and community leaders to help develop a research agenda for Oregon.

➔ Coordinate research agendas across states and regions to avoid redundancy.

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10. PROVIDE FUNDING FOR KEY ACTION AREAS IDENTIFIED IN THIS REPORT

The importance of adequately funding a multi-track strategy cannot be overstated. State and local decision makers will need to marshal financial investments commensurate with the scale of climate change and the risks it presents to Oregon's economy, citizens, and natural environment. Key areas for immediate funding identified by the CCIG in their deliberations are listed below.

➔ Allocate funding for multi-disciplinary and multi-county regional teams to develop and advance regional adaptation and preparation agendas, as well as potential regional mitigation strategies.
➔ Allocate funding for education and outreach activities in the range of $100,000.
➔ Provide additional funding for OCCRI in the range of $800,000 per biennium.

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What do these have to do with Agriculture?

- Currently no acknowledgment is given to production agriculture for the carbon sequestration;
- Why not? Because the science has not caught up with the debate.

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Agriculture's Conundrum ~

- Net vs. Gross Emissions
- Accurate measurement of smoke stack emissions (City vs. the Country)
- Artificial Expectations Exist in the minds of the Policymakers absent Scientific Data to support Regulatory Framework
- Agriculture is viewed as the cornerstone to "Cap & Trade" System

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More Questions than Answers…

- How will Agriculture's contribution to "clean air" be accurately measured?
- Who will measure Agricultural emissions?
- What are the economic factors for the agricultural producer?
- Does Carbon Sequestration equate to certain tillage practices?
- What about compensation for yield loss?

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Net Emissions and the Oregon Inventory

The Oregon greenhouse gas inventory is a “gross” inventory process. Only emissions of greenhouse gases are counted and summarized in these pages. Some inventories also report on “net” emissions – which is the difference between the total emissions of greenhouse gases and carbon sinks (which sequester carbon out of the atmosphere). There are two major components to such an analysis. By far the largest potential sinks for Oregon are land use changes and forestry carbon dynamics (abbreviated “LUCF”). A secondary sink is carbon that is sequestered in landfills. However, due to substantial issues with forestry and land use data, Oregon is not yet ready to provide a net emissions total in its greenhouse gas inventory.

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Figure 12: Greenhouse Gas Emissions Breakdown by Gas for 2004

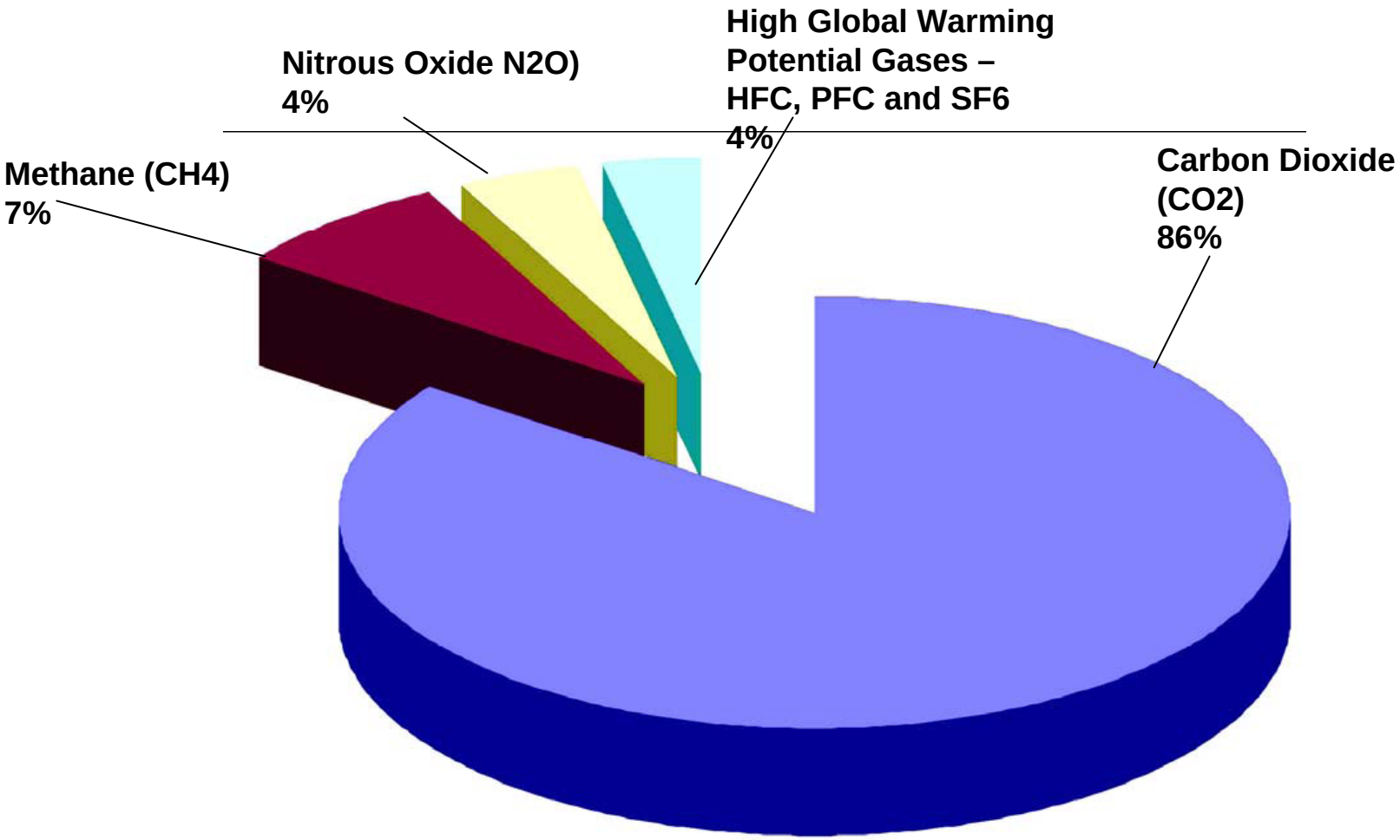

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Figure 14: Electricity Supply Mix in 2005

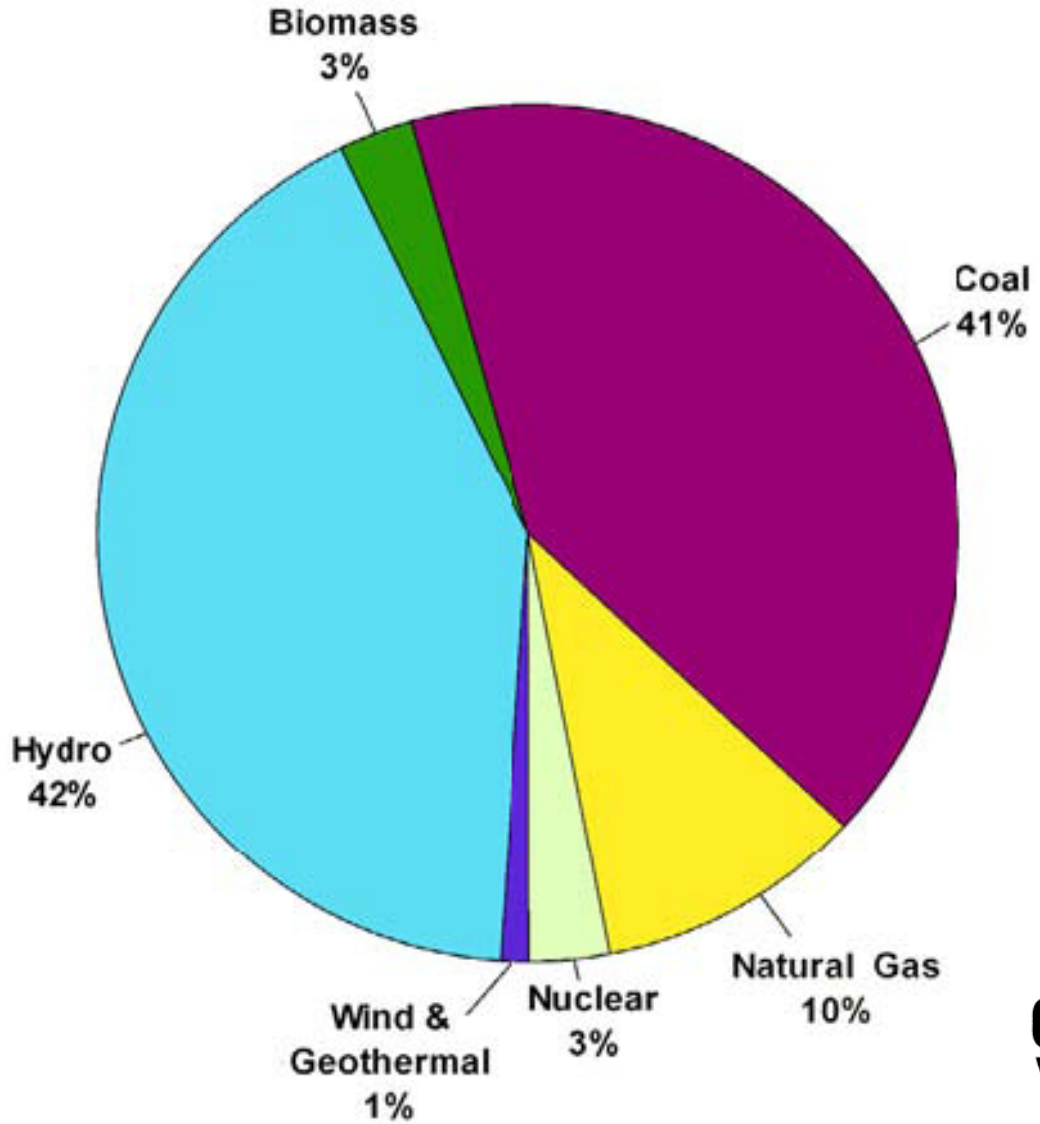

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Figure 15: Methane Emissions by Source in 2004

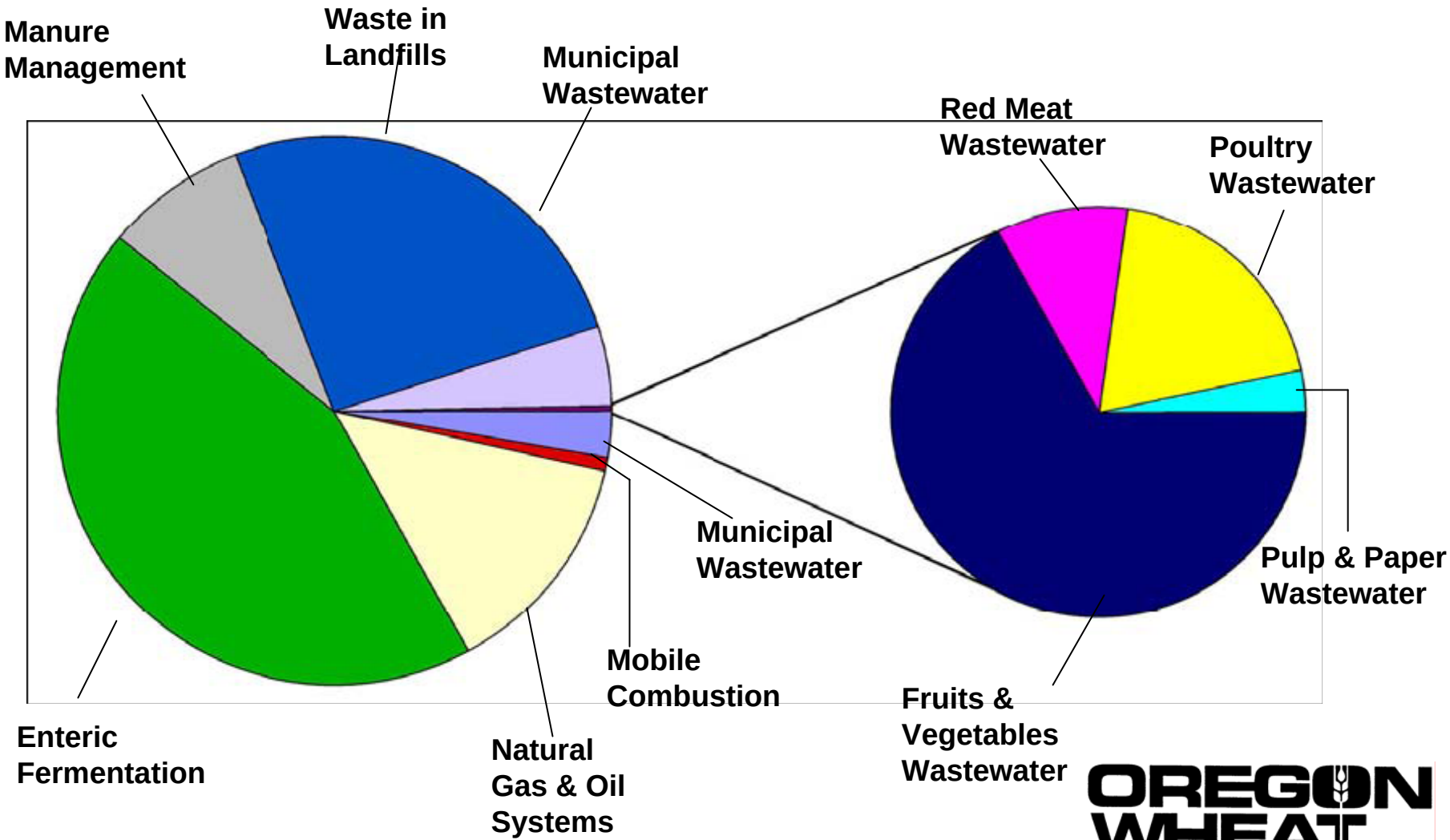

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Figure 16: Nitrous Oxide Emissions in 2004

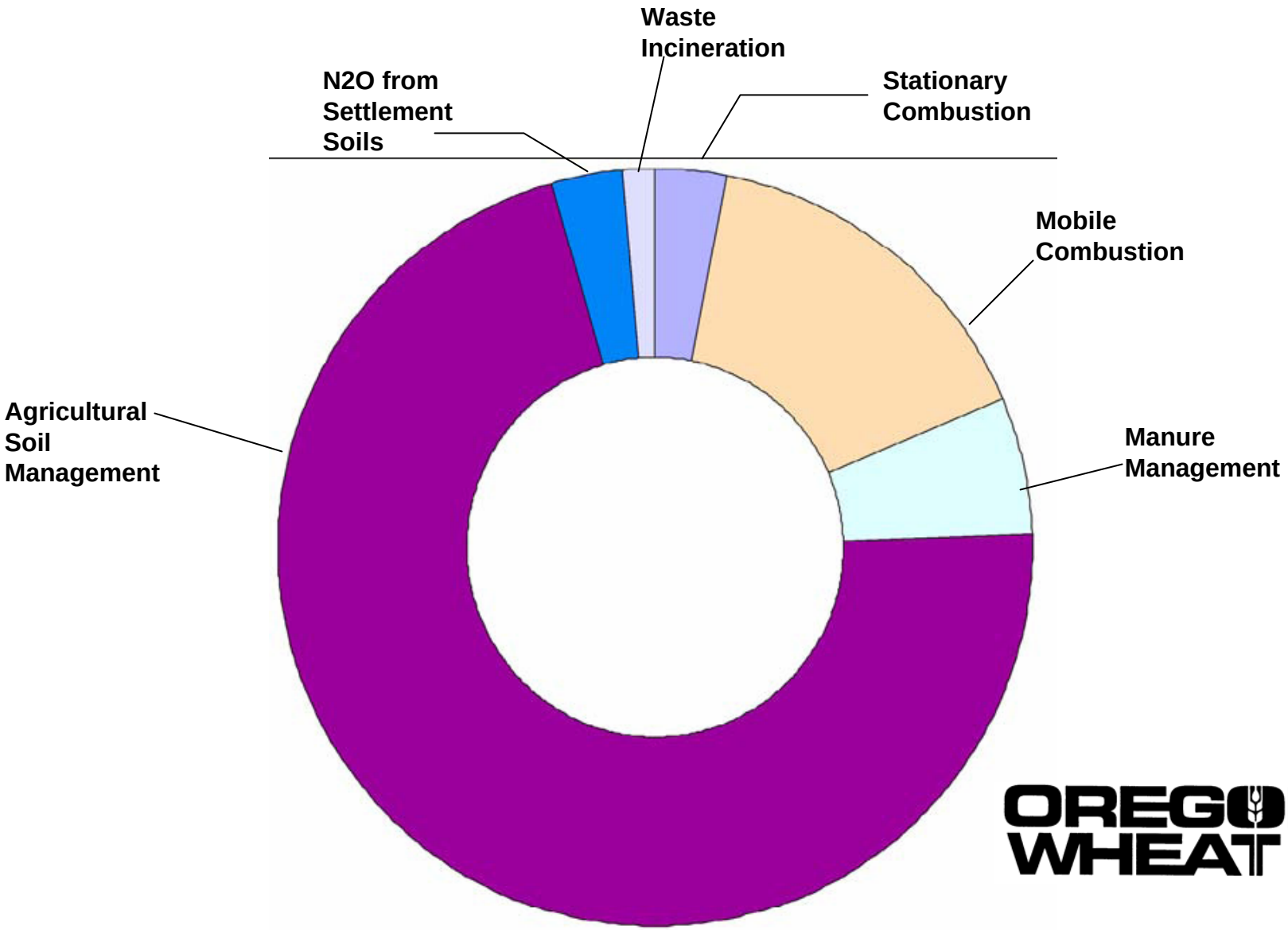

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Figure 17: High Global Warming Potential Gas Emissions in 2004 (HFCs, PFCs, and SF

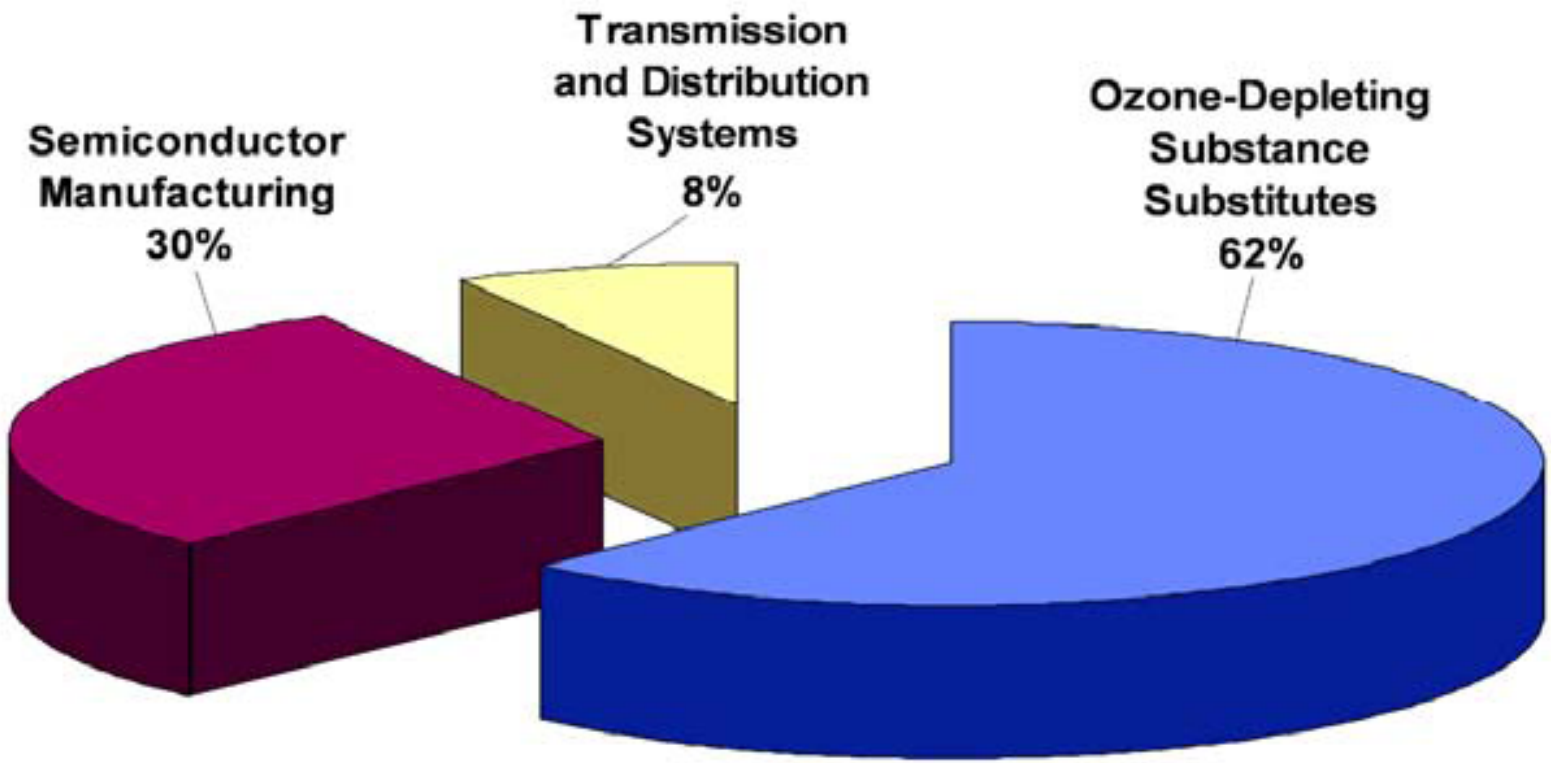

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Figure 18: Sector Contributions in 1990

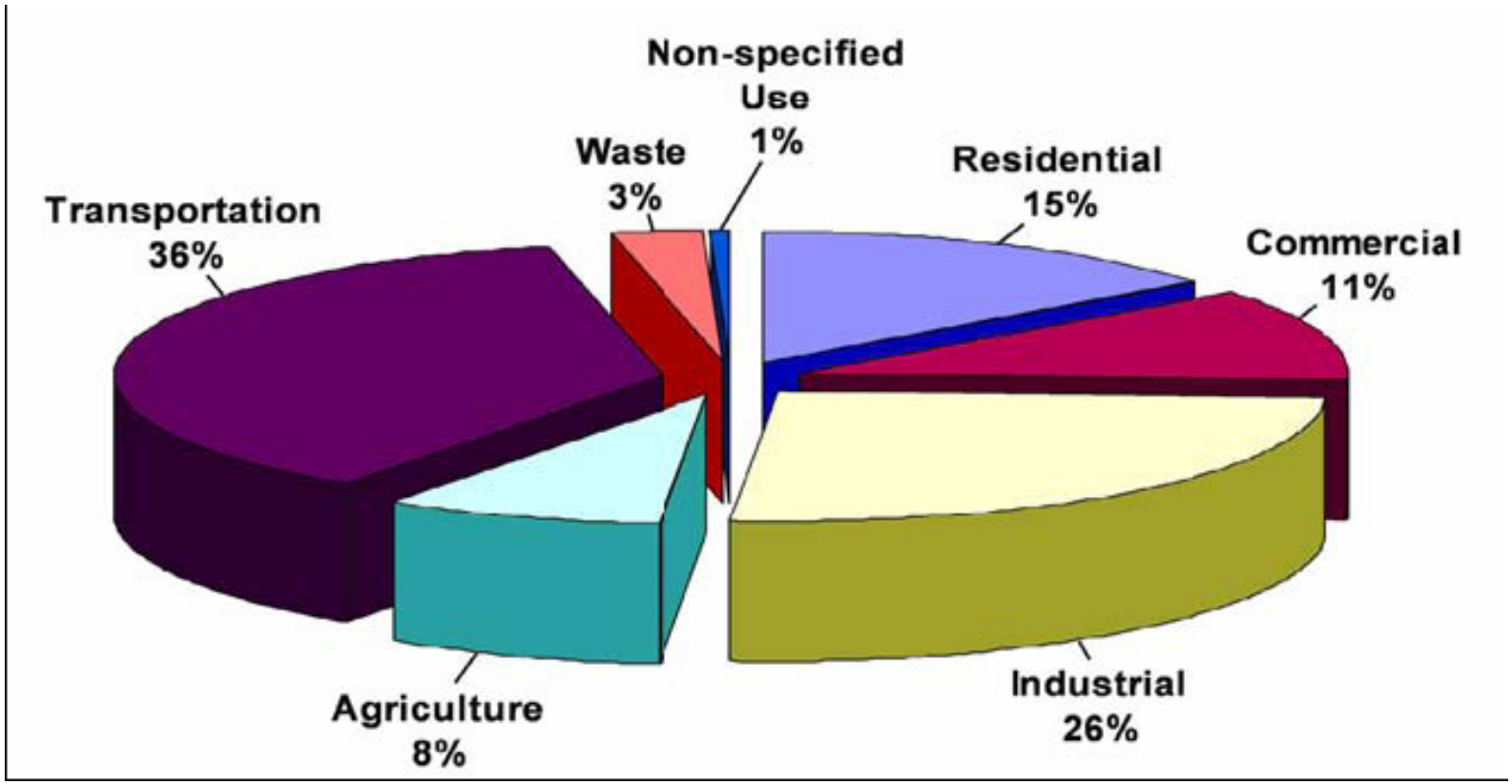

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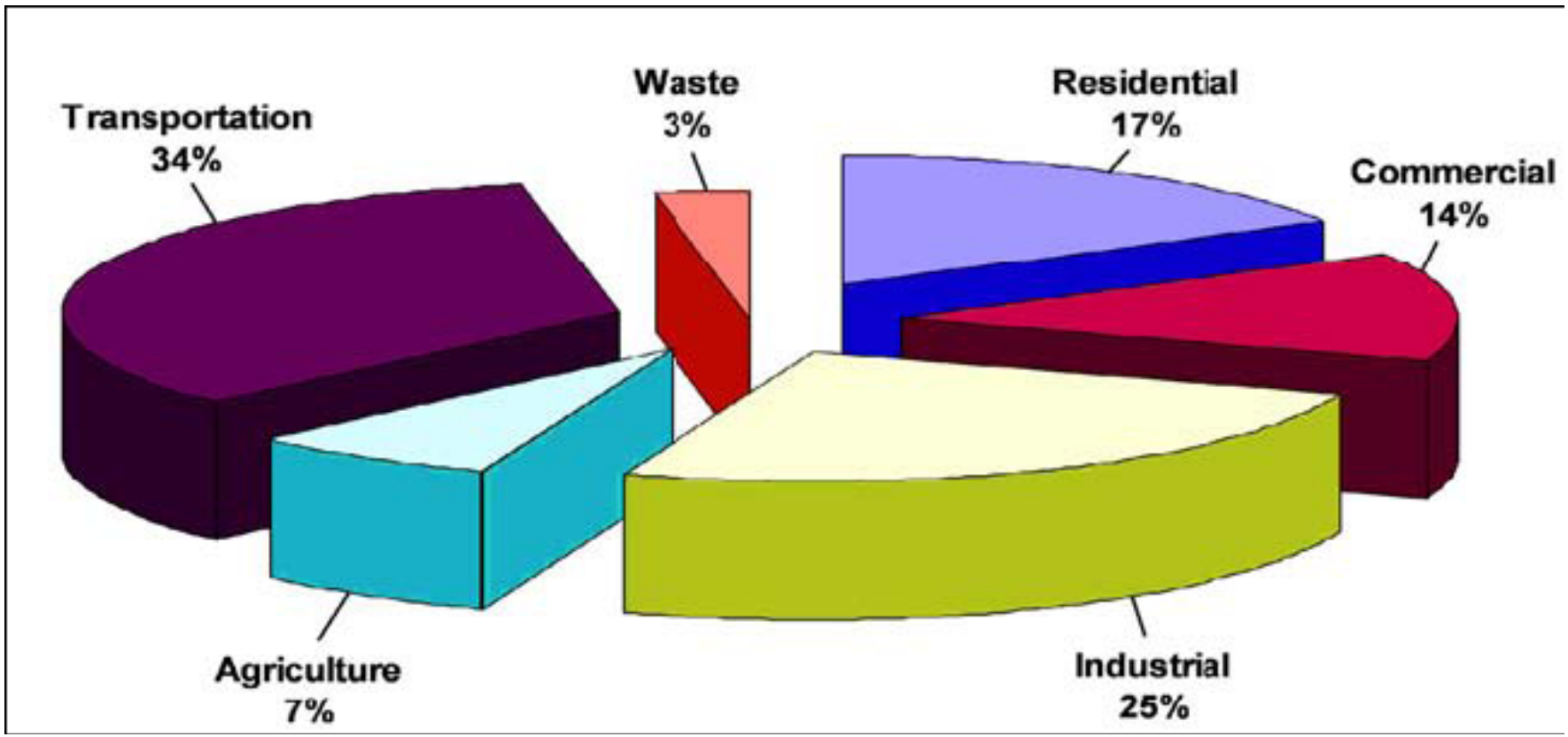
Figure 19: Sector Contributions in 2004



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Where is the best Scientific Community to Answer these Questions

- Land Grant Universities?
- Private Sector Research Community?
- Ag Research Service?

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Production Ag Thinks - ARS

Why ARS?

- ARS is a dedicated third party
- ARS is federally funded
- ARS focuses on Nationwide Priorities

What's Needed?

- The NW Climate Change needs to be an ARS Customer
- A national framework for scientific analysis and peer review
- Analysis of Agricultural emissions and photosynthesis – we need answers

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How do We Set Up a Regulatory Framework to measure Agriculture?

- Answer…

I don’t know…

- But I am confident the scientists of ARS can work to create the necessary baselines and protocols predicated on science vs. rhetoric and emotion.

Through this effort ARS can…

- Help Oregon develop a rational framework
- Work with the Climate Change Commission
- Broaden ARS Stakeholder base
- Increase Public Awareness of ARS
- Solidify funding base for all ARS research priorities

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I have a dream…

- Of developing a science based funding request for policymakers;
- Saving the Wheat Industry;
- Championing Climate Change;
- Ensuring Global Food Supply into the future!

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Thank you

- For Your Attentiveness
- For Your Willingness to Engage
- For Saying Yes to the Charge and leading the way to quantifying Agriculture's emissions and establishing a fair and balanced framework for policymakers!

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