



Baseline Carbon Footprint

June 2008

Temporal Boundary

June 2007 thru May 2008



Contents

1. Cover
2. Contents
3. Basic Terminology
4. Strategic Focus
5. Footprint Scope Background
6. Footprint Executive Summary
7. Footprint by GHG Scope
8. Building Energy Footprint
9. Campus Energy Discussion
10. Campus Energy Details
11. Transportation & Equipment
12. Commuting Footprint
13. Commuting Distance Impact
14. Events Footprint
15. Miscellaneous Footprint
16. Waste Background
17. Why Footprint
18. Sustainability vs. Green
19. What this Report Means
20. Essential Next Steps for ASHS
21. Sodexo-Loyalton Solutions

The Sodexo / Loyalton Group Educational Facilities Team is pleased to present this Carbon Footprint Report. We would like to extend our gratitude to the many Sodexo and Adlai Stevenson High School officials and associates that have participated in the compilation of data required to inform this report.

- **Footprint** - The environmental impact (GHG emissions, product use, resource depletion, etc.) that arise from the operation of the enterprise
- **Greenhouse Gas (GHG)** - Gases that tend to increase atmospheric temperatures
- **Carbon Dioxide Equivalent (CDE)** - Six gases have a scientific equivalency to carbon dioxide, interchangeable with equivalent carbon dioxide (ECO₂)
- **Tonnes** - Metric tons (2,205 pounds), the standard for reporting GHG emissions, shorthanded as TCDE (tonnes of CDE) and MTCDE (thousand tonnes CDE)
- **Kg** - Kilograms (2.2 Lbs per Kg; 1,000 Kg per metric tonne), the standard for reporting small quantities of emissions
- **Passenger Miles** - The number of passengers in a vehicle over the length of the trip; two people in one car going 10 miles results in 20 passenger miles
- **Kwh** - Kilowatt hours, the standard for reporting electrical energy consumption
- **MMBtu** - A million British Thermal Units (BTU); BTU and MMBtu are standard measures of heat energy equivalency
- **Sustainability Action Plan** - A plan to manage an enterprise footprint



- **Become accountable for GHG emissions**
 - Identify, quantify, and report GHG emissions
 - Fulfill first step in carbon management / sustainability hierarchy
 - Initiate change, introduce over-arching GHG strategies

- **Technical approach**
 - Data was handled using GHG Protocol, Clean Air Cool Planet (CACCP) tools
 - Technical methodology and data sets are contained in the Appendix

- **Comparisons to other facilities**
 - Misleading to compare footprints between organizations; two facilities in the same city with identical physical assets and user populations could have remarkably different footprints due to differences in academic mission, operating hours, reporting categories, etc.

- **GHG Protocol defines “scope” boundaries of CDE emissions**
- **Typical scope 1 & 2 emissions profile**
 - 30% - Large scope 1 direct emissions - combustion of fuels in equipment; boilers, furnaces, process heating equipment
 - 10% - Small scope 1 emissions – refrigerant gases, livestock, grounds-keeping, and fleet and equipment fuel consumption
 - 60% - Scope 2 imported emissions - purchased energy; electricity, steam, hot water, chilled water, or similar production uses
- **Typical scope 3 emissions profile**
 - Scope 3 indirect emissions are an optional reporting category
 - Noted in provisional for discussion and orientation only
 - School decides if and how to report these factors in baseline
 - When reported the range of additional emissions profile could be
 - ▶ Air travel 10% to 20%, faculty-staff-student commuting & transportation 30% to 50%, events 50% to 100%, dining services 20% to 50%, waste stream 1% to 5%

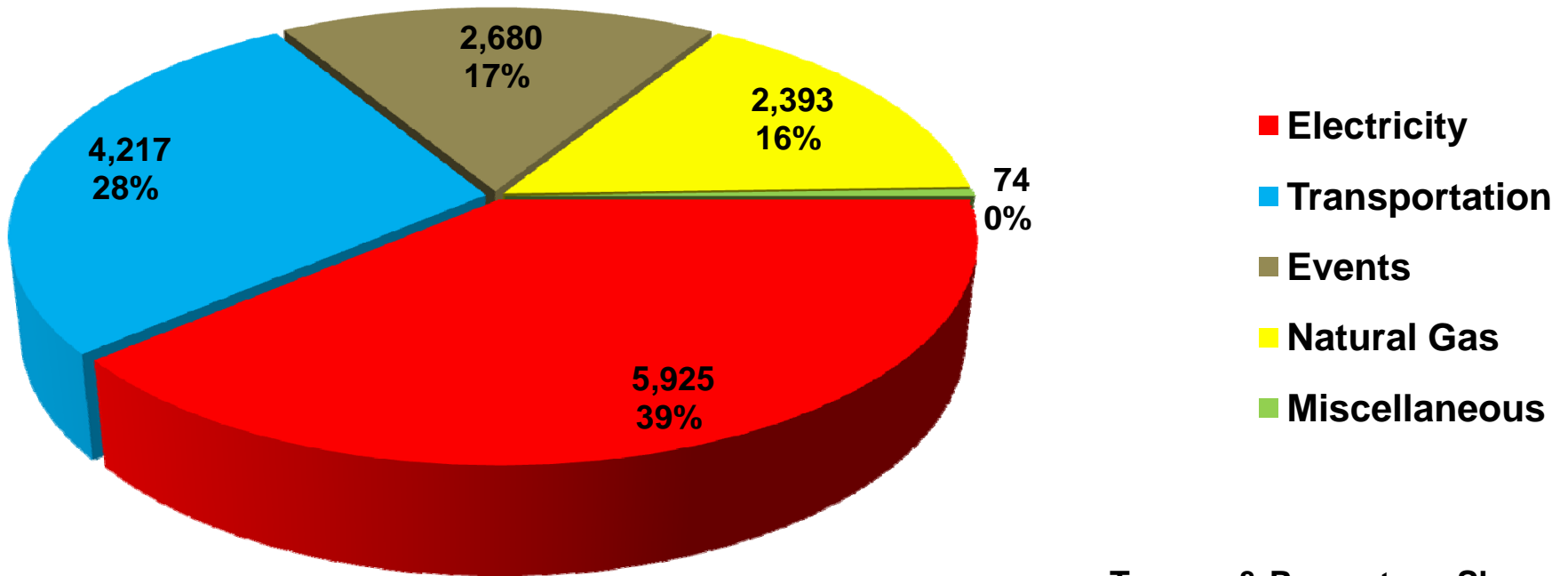


Footprint Executive Summary

■ Scope emissions activities included in this summary

- Includes purchased electricity, purchased natural gas, transportation activities including fleet and equipment operations, school events, food service, and miscellaneous grounds-keeping and chemical usage

15,289 TCDE - 3.37 T / Student - 4,530 Students

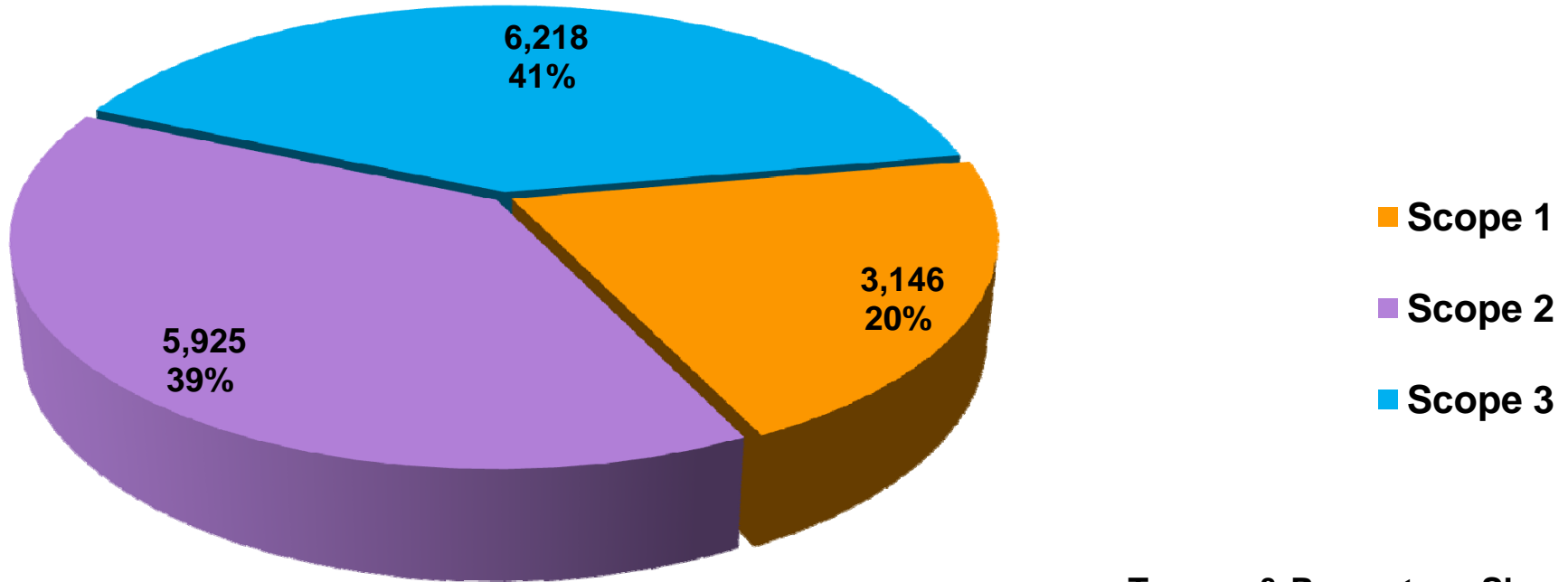


Tonnes & Percentage Shown

Footprint by GHG Scope

- The common reporting summary
 - Showing common GHG reporting scopes and totals

15,289 TCDE - 3.37 T / Student - 4,530 Students



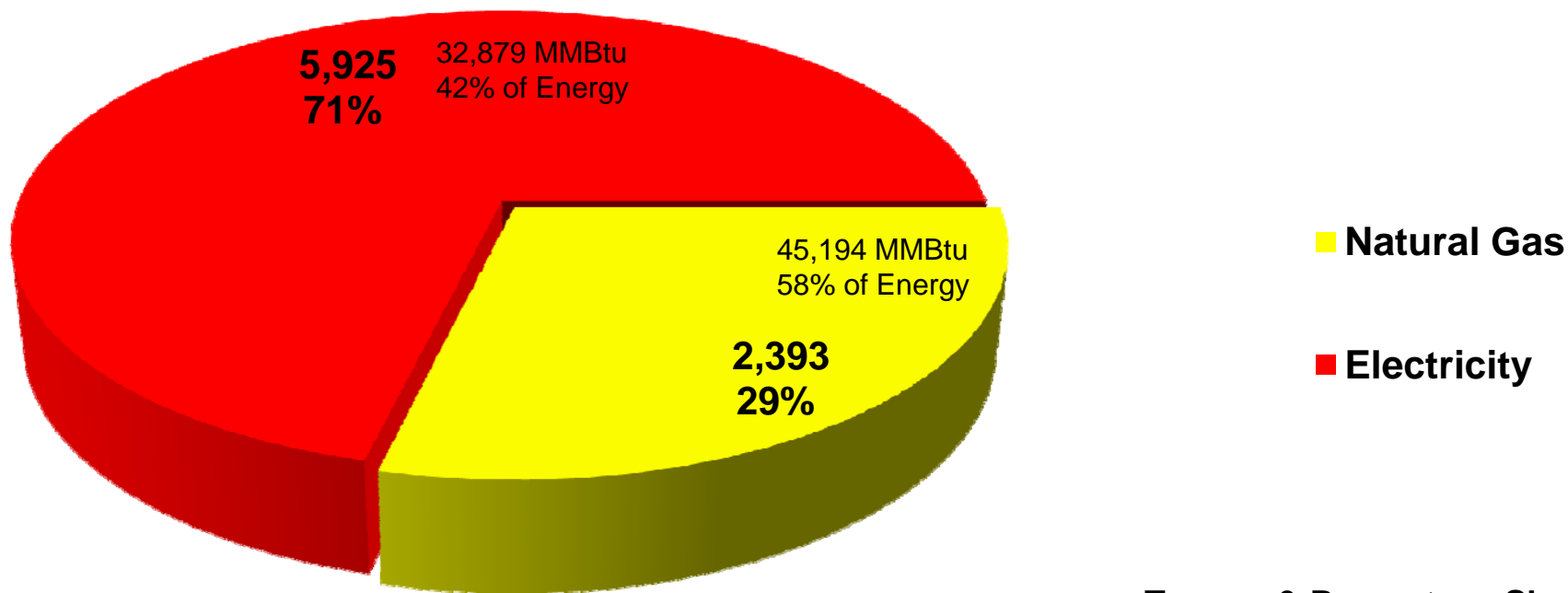
Tonnes & Percentage Shown

Building Energy Footprint

■ Summarizes total energy consumption

- From scope 1 direct combustion and scope 2 purchased sources, largest overall contributor to emissions
- Next slide explains relationship of energy profile to GHG emissions profile

8,317 TCDE - 1.84 T / Student - 4,530 Students



Tonnes & Percentage Shown



Campus Energy Discussion

- **Campus energy and emissions profile reveals important factors**
 - Share of CDE from sources is often very different than share of energy
 - Emissions from electricity highest per MMBtu delivered

- **Electricity starts at central station plants**
 - 30% to 35% of fuel energy converted to electricity
 - 65% of energy is lost as waste heat to the environment
 - Another 10% is lost in transmission and distribution losses
 - Dominated by fossil fuel use, which drives local grid emissions

- **Heat energy starts in boilers and furnaces at your facility**
 - 60% to 80% of fuel is converted to thermal energy
 - 20% to 40% of energy is lost as waste heat to the environment

- **Conventional energy systems waste as much as 60% of fuel energy**
 - Energy source replacement could be a key emissions reduction strategy

■ Electric generators

- Three 765 KW natural gas fired electric generators used for generation, peak load demand control, or load shedding
- Not metered separately to enable a detailed analysis of performance impact
- Reported that usage is down due to increasing natural gas prices
 - ▶ An increase in use would reduce GHG emissions in comparison to utility grid mix
 - ▶ Cost to do so would be prohibitive under current commodity pricing pressures

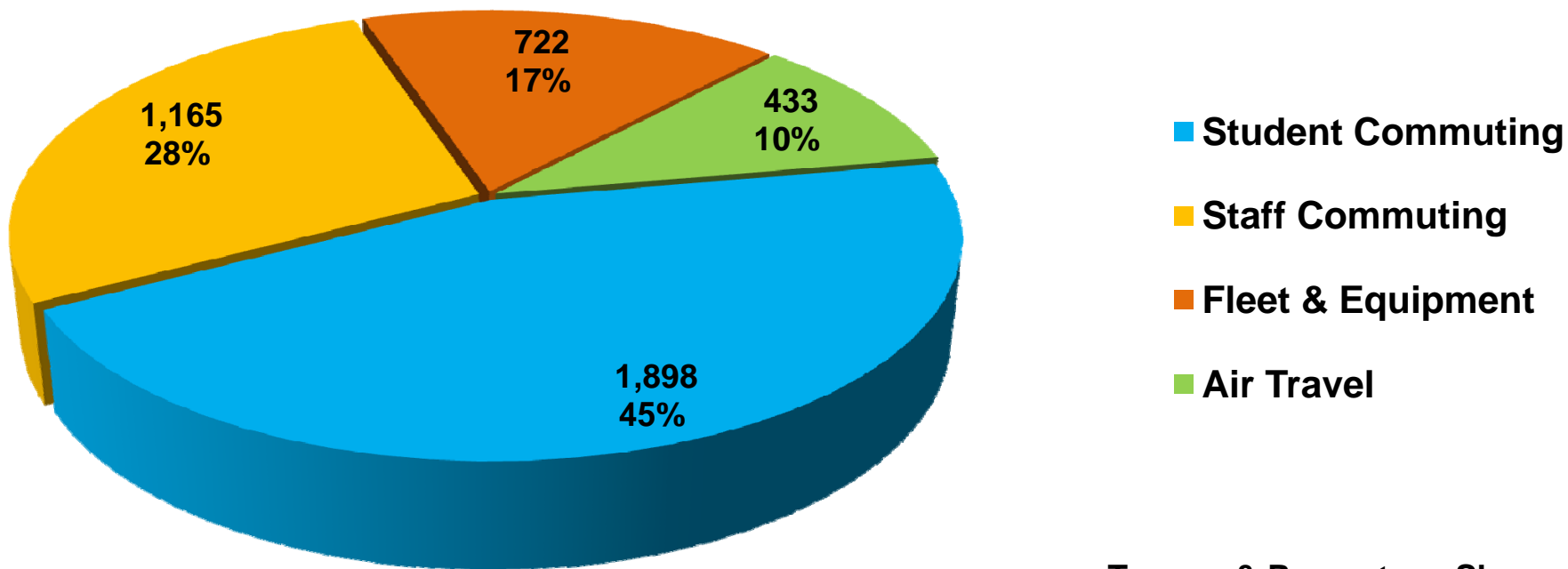
■ Emissions per hour

- Students, faculty, and staff population using the building throughout the year amounts to 6,428,930 user-hours
- Each user's need for heat, light, air-conditioning, and ventilation results in 2.85 pounds of CDE emissions for every hour at the facility

■ Developed from survey data

- School fleet and equipment fuel usage, commuting and air travel
- Air travel has a substantial CDE impact, at high altitudes, jet-engine GHG emissions have greater chemical and photosynthetic reactions, exacerbating the atmospheric warming potential of emitted GHG

4,217 TCDE - 0.93 T / Student - 4,530 Students



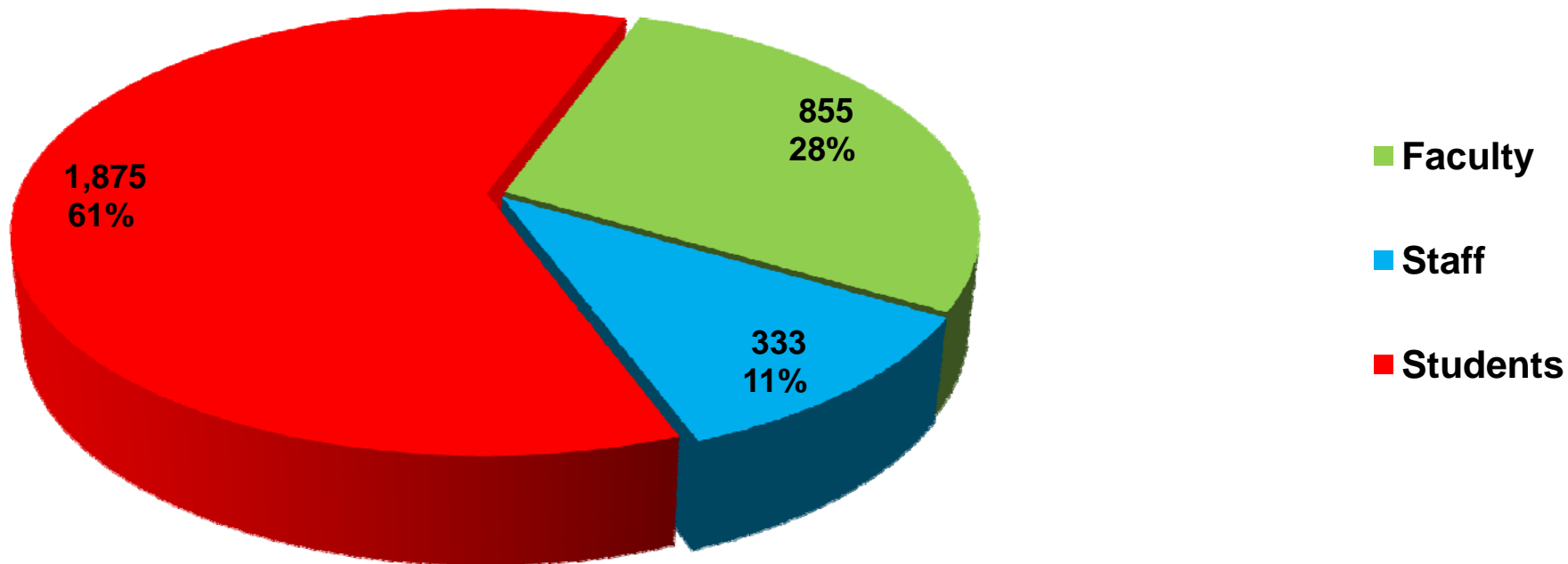
Tonnes & Percentage Shown

Commuting Footprint

■ Developed from survey data

- Results from consumption of 283,347 gallons of gasoline, 52,662 gallons of diesel for commuting by car, car-pool, and bus transit (school and public)
- Purpose in reporting to expose the school to all emissions that can be influenced by behavioral or programming initiatives

3,063 TCDE - 0.68 T / Student - 4,530 Students



Tonnes & Percentage Shown



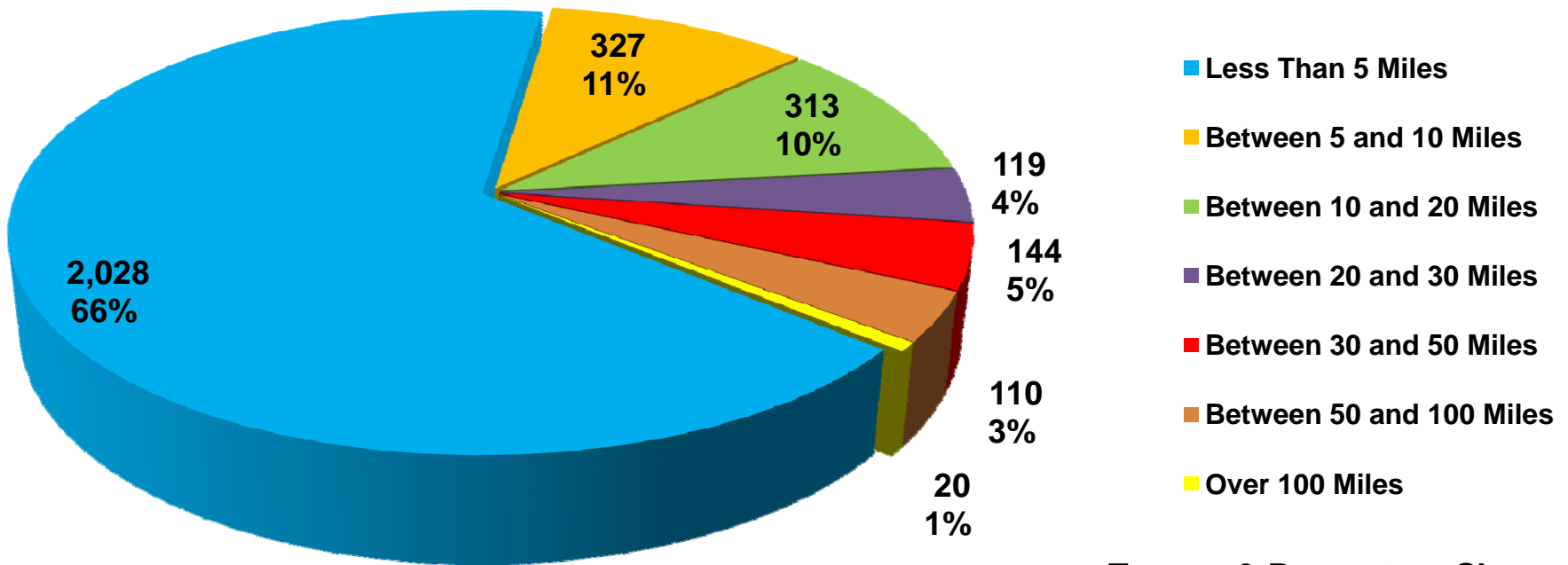
Commuting Distance Impact

■ Transit choices

- Individual car use is preferred transit method
- Frequency of transit impacts noted below

	Faculty	Staff	Students	Total
Car-Miles / Day	31.83	19.89	4.82	19.26
Car-Pool Miles	1.11	5.92	6.11	5.13
Bus-Miles / Day	2.71	0.13	7.37	2.75
Total Miles / Day	34.54	25.93	18.31	27.14

3,063 TCDE - 0.68 T / Student - 4,530 Students



Tonnes & Percentage Shown

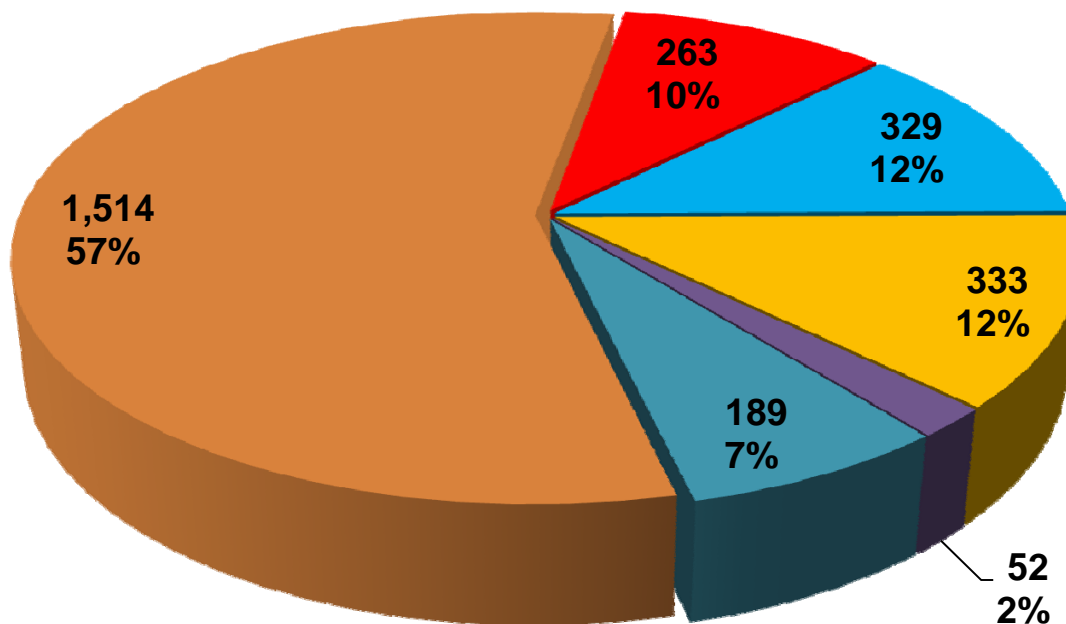


Events Footprint

■ Optional reporting category not included in total footprint

- Reporting to expose all emissions that can be influenced by behavioral initiatives
- Difficult to implement reductions due to the fact that events are mounted by a variety of users, utilize multiple products and goals, are not always under complete control of the school, often inseparable from the core mission or curricula
- Impact is typically substantial, reduction strategies start with awareness

2,680 TCDE - 0.59 T / Student - 4,530 Students



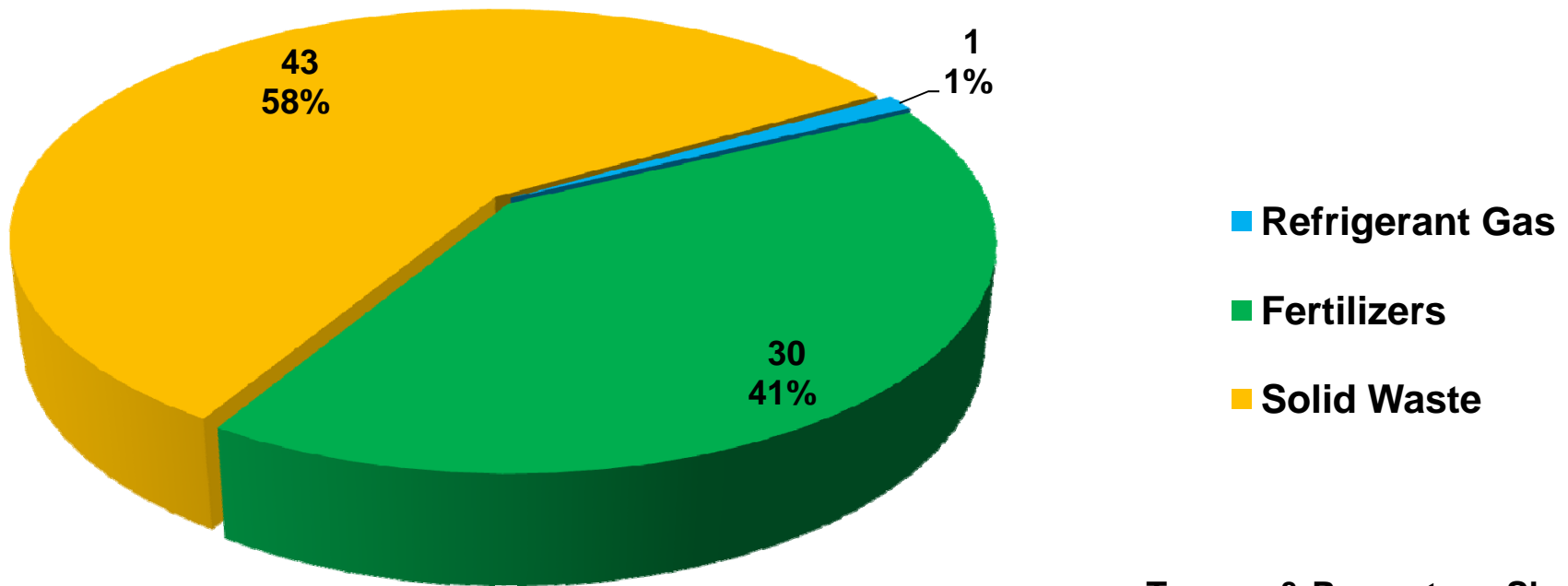
- Home Sporting Events
- Away Sporting Events
- Student Life Events
- Performing Arts
- Food Service Catering
- Daily Lunch

Tonnes & Percentage Shown

Miscellaneous Footprint

- Includes small direct and indirect sources of emissions
 - Refrigerant gases emitted in small quantities but substantial GHG impact
 - Grounds-keeping fertilizers
 - Waste stream impacts only, see next slide for background

74 TCDE - 0.02 T / Student - 4,530 Students



Tonnes & Percentage Shown

- **Special note about reporting**
 - Figures used herein do not include any life-cycle (LCA) benefits
 - When LCA benefits included, outcome is often a negative emissions profile

- **246 million tons total waste generation in US in 2005**
 - 79 million tons recovered for recycling & composting
 - National average emissions profile for 1-ton of mixed waste
 - ▶ Portion that goes to landfill adds 420 Kg of GHG
 - ▶ Portion that goes to compost subtracts 200 Kg GHG
 - ▶ Portion recovered for recycling subtracts 2,910 Kg GHG
 - **Recovery a 790% emissions improvement over landfill**



Why Footprint

- **Competitive factors rapidly changing**
 - Consumers desire green options
 - Students seek green campuses

- **Brings focus to energy fuel costs and choices**
 - Largest budget item after labor; hard to pin down as commodity costs gyrate
 - Footprinting opens door to alternatives and reduction opportunities

- **Regulatory Trajectory**
 - 30+ states have sustainability initiatives or GHG reporting rules
 - EPA recently enacted GHG reporting rules
 - Carbon management here to stay, regardless of cap-trade legislative outcome

- **Bottom Line**
 - Crucial to academic metrics, cost-risk mitigation, and regulatory trajectory
 - Attractive to students, staff, community, stakeholders



Sustainability vs. Green

■ What works for your enterprise

- Sustainability, green, green technology, eco-practices
- Self-defined, no standards exist, voluntary approach

■ Going green

- Some believe green more readily resonates with consumers
- An acronym for “we are environmentally sensitive”

■ Sustainability has broad organizational implications

- Three core dimensions; economic, environmental, social
- 'Triple Bottom Line' (TBL) or full cost accounting; people, planet, profit
- Business and historical muscle

■ Set your mission

- Define mission, phase solutions by ranking benefits
- Set goals and achieve commitments that make sense



What this Report Means

- **This footprint report is a statement that ASHS**
- **Made the 1st step towards becoming a sustainable organization**
 - Sustainability is not a destination, it is a process
 - You are either more or less sustainable in approach to consumption of natural, capital, and human resources
- **Is on the path to become “carbon neutral”**
 - Carbon neutral organization has consumption of fossil fuels and other natural resources in balance with the replenishment of the fuel source
 - Captures and reduces greenhouse gas emissions
- **Is a leader**
 - Cutting edge of organizational behavior is along path of sustainability



■ Key strategies in order of importance

1. Commit - To sustainable practices and deployment of a carbon management plan
2. Plan - Create a framework strategy for energy and carbon reduction endeavors
3. Do the Doable - Immediately take no-cost actions that make a consumption difference
4. Procure - Utilize strategic energy commodity purchasing to reduce costs and avoid erratic budget impacts, source and purchase renewable energy, REC's, and offsets
5. Audit - Building energy performance, identify, quantify, and prioritize potential energy management improvements with a cost and carbon payback analysis
6. Investigate - Best practices options to construct audit findings energy reduction projects
7. Locate - Fund sources that can be used for energy and GHG reduction projects, tap into federal, state, utility, and private funding sources and carbon-offset banks
8. Implement – Execute building energy performance improvements in a sequential and consistent manner, utilize high-performance design and construction standards
9. Manage - Report activities continuously, alongside budget performance
10. Go Green - Source, join, and comply with an applicable green industry standard

- **Sodexo and Loyalton teamed up in 2006 to**
 - Control energy costs
 - Identify and motivate energy efficiency improvements
 - Provide carbon management and sustainability solutions
 - Over \$6 million in identified savings to date and climbing

- **For more information contact**

Terrence G. Matula
Sustainable Business Solutions
The Loyalton Group
1620 South Frontage Road
Hastings, MN 55033
(651) 480-3126 ex. 132
www.loyaltongroup.com