Scope 3 GHG Emissions

Planning for cost-effective emission reductions

November 3, 2010

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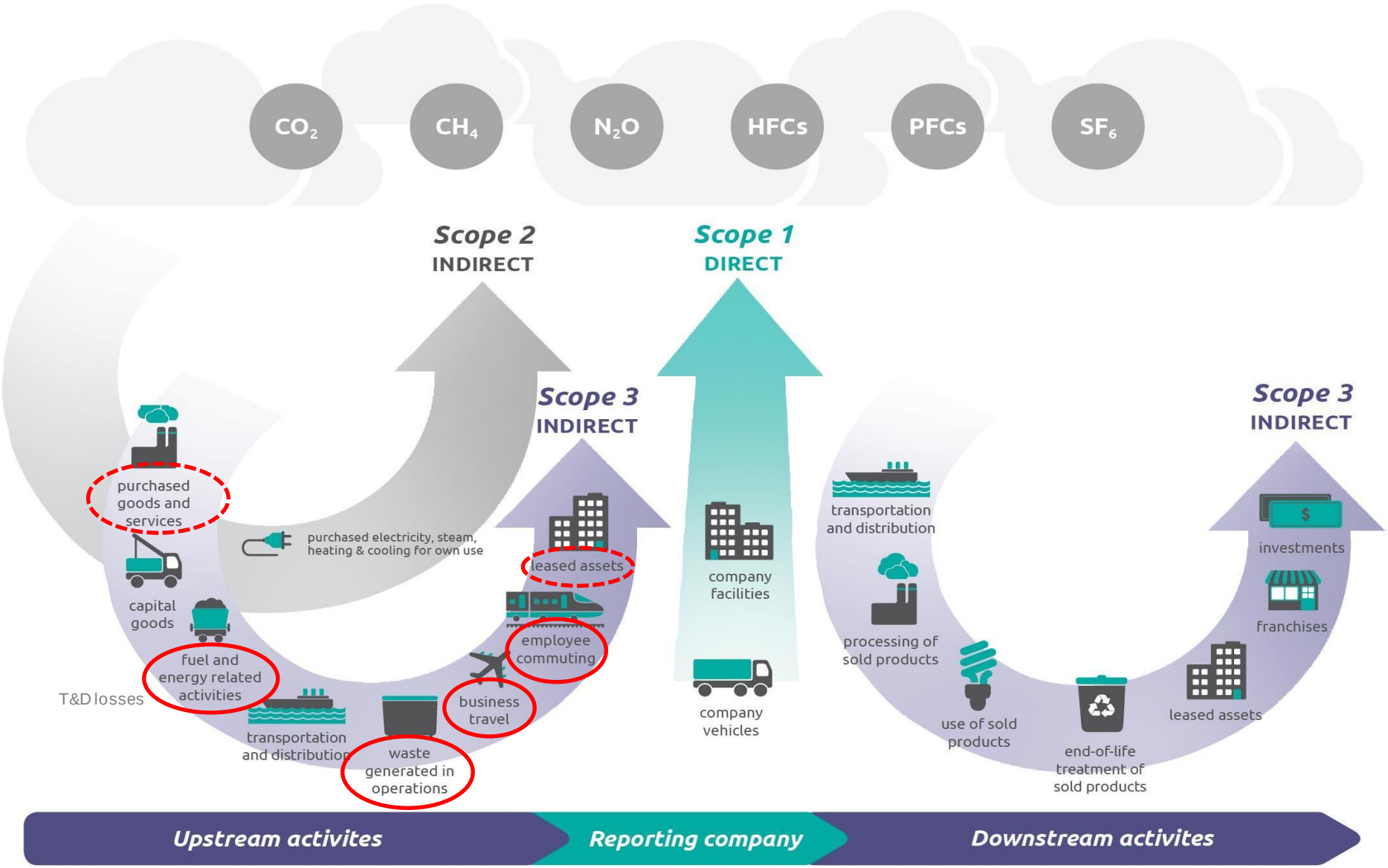
Training Overview

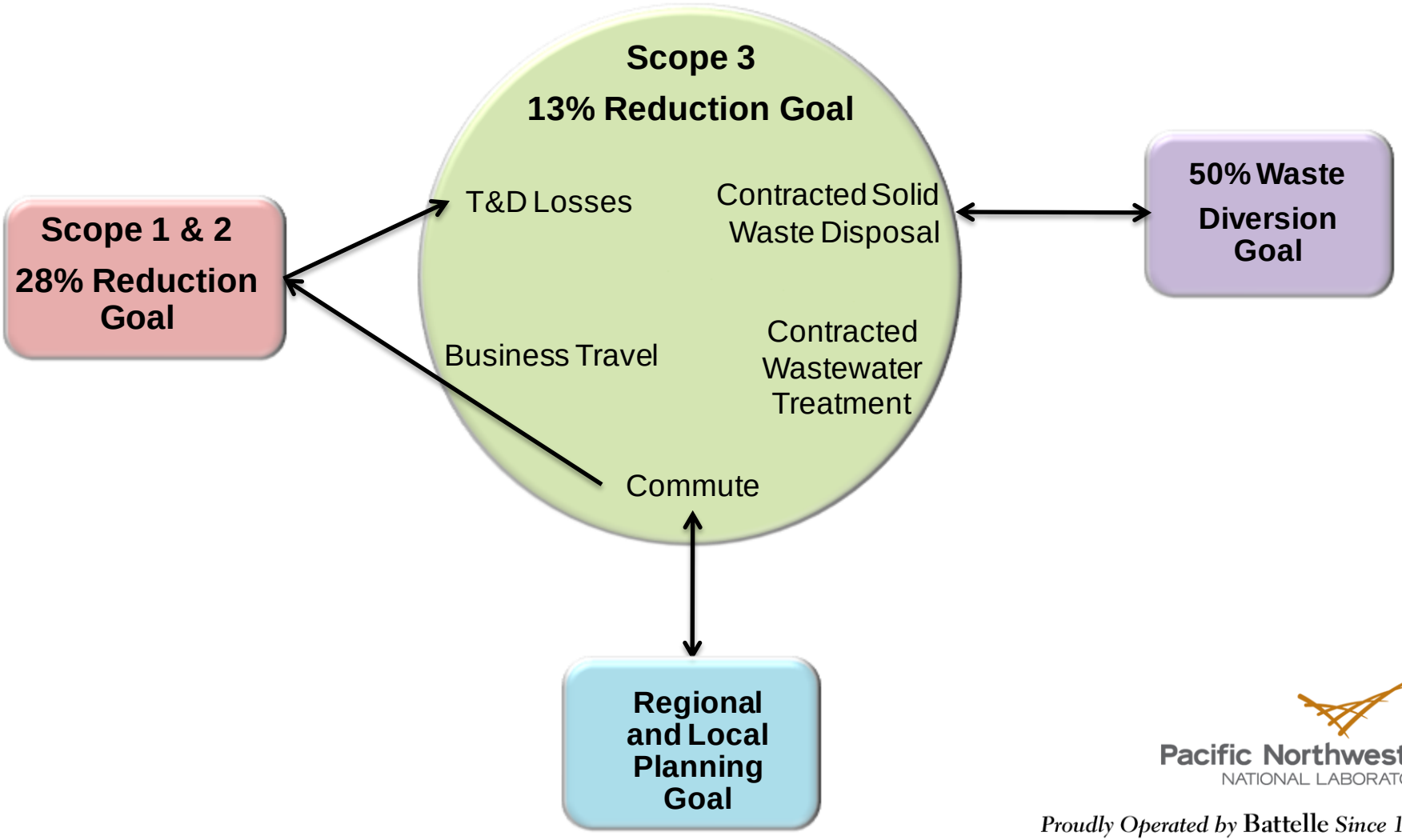
- Scope 3 Emissions – What are they and why do they matter?
- Cost-Effective Planning for Scope 3 Reductions
- Example: Planning for Employee Commute Emission Reductions
- Success Stories

Scope 3 Emissions

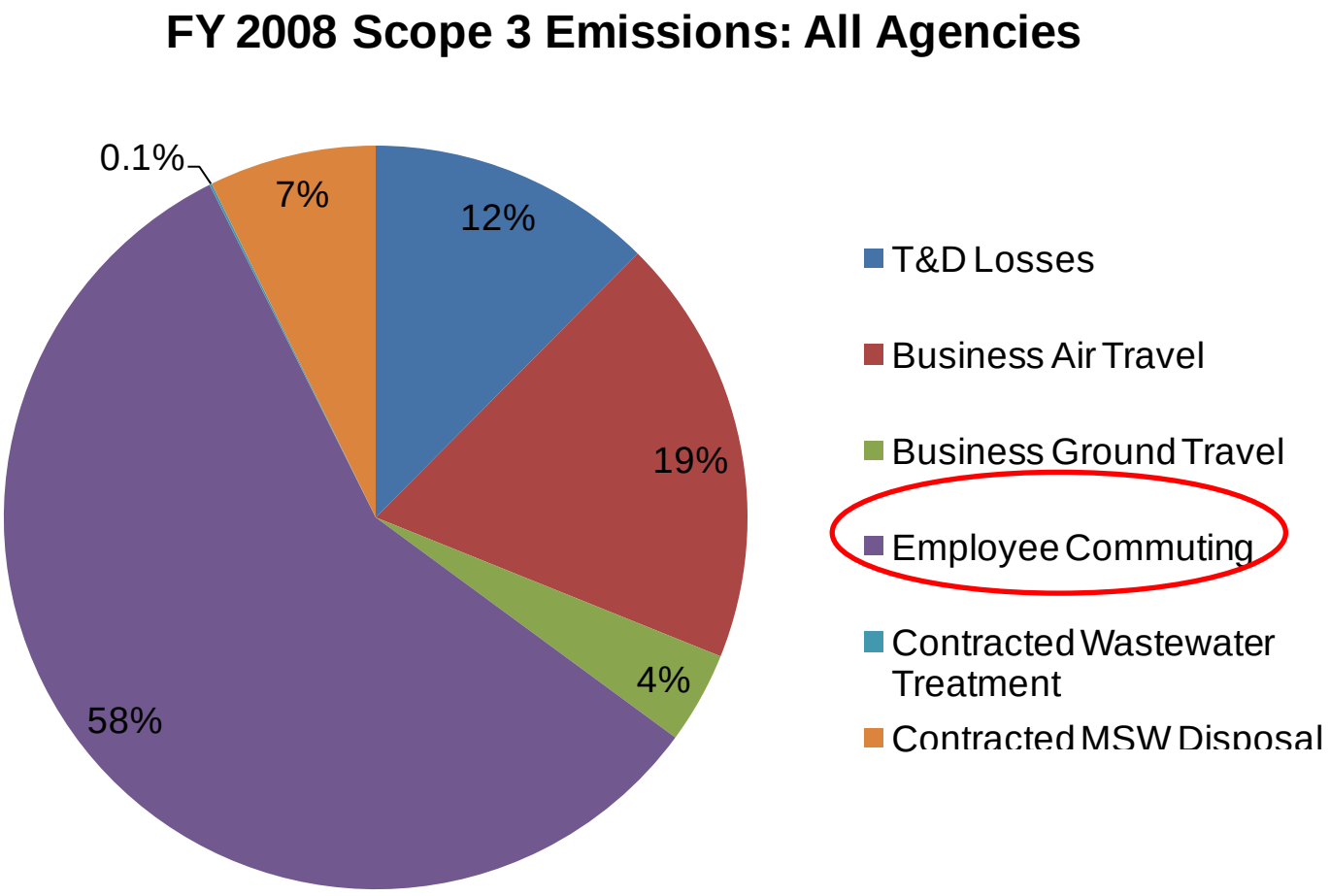


Modified from World Resources Institute (http://www.ghgprotocol.org/node/178/)

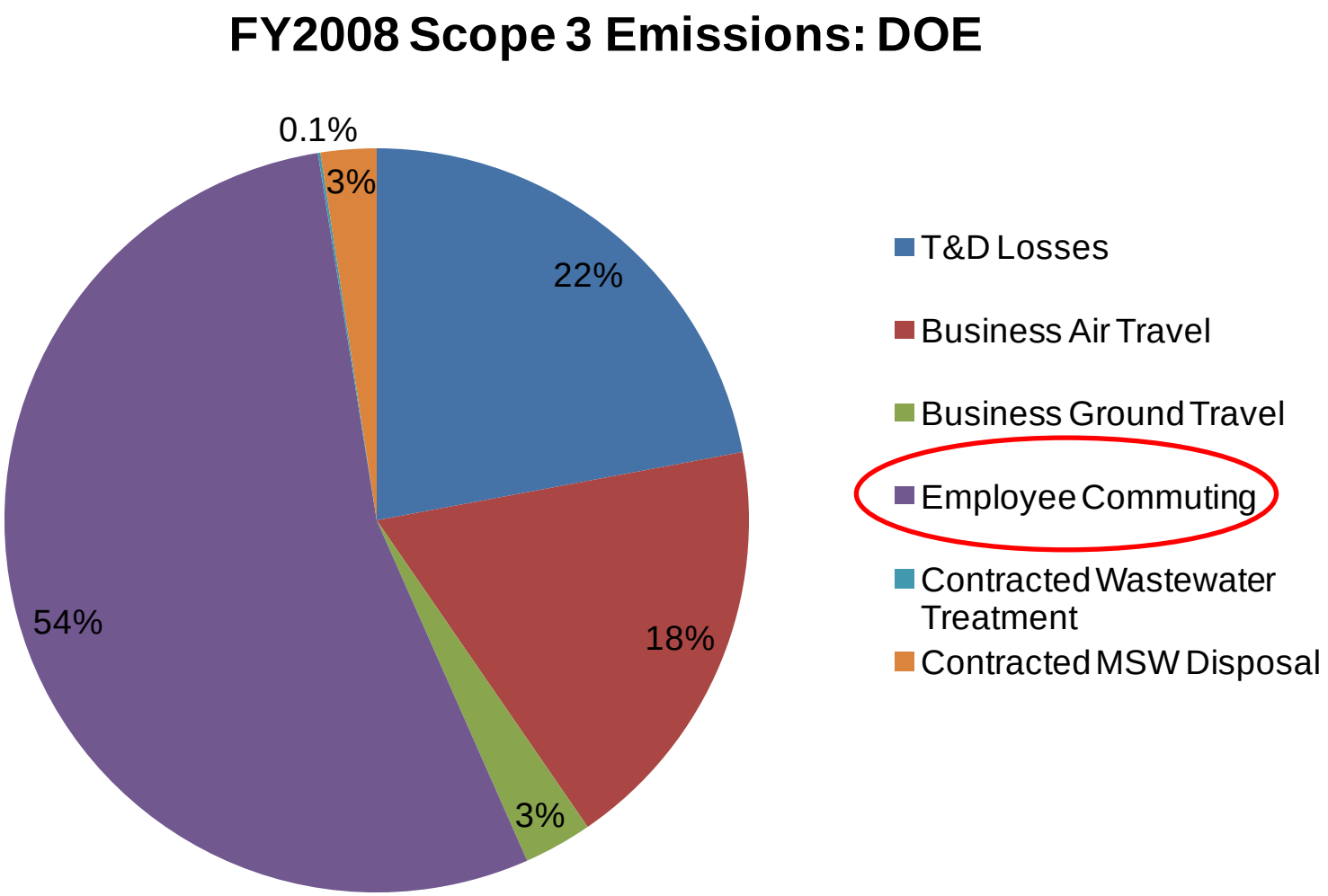
Scope 3 Emissions and Related Goals



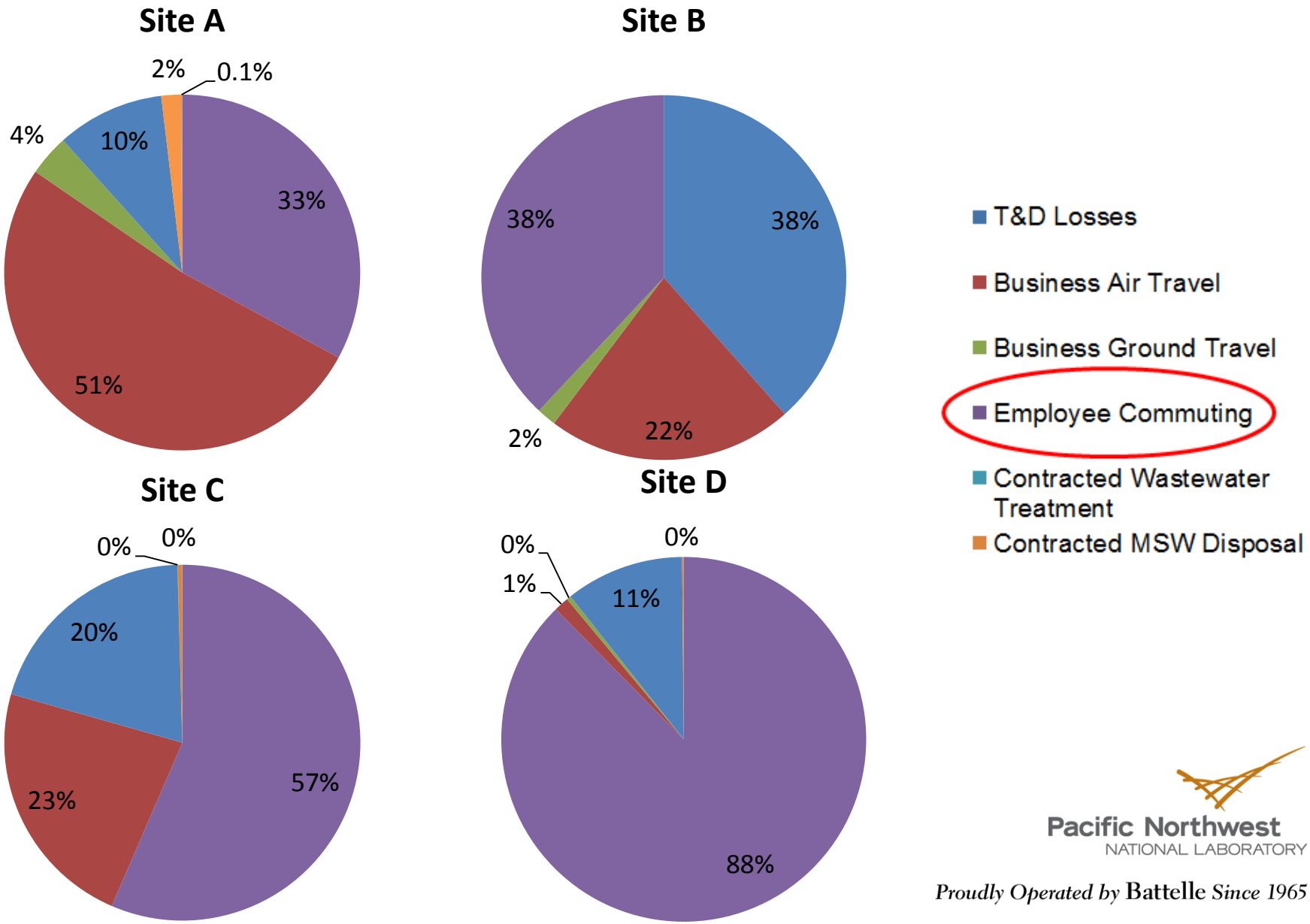
Scope 3 Emissions in the Federal Government



Scope 3 Emissions in DOE



Scope 3 Emissions at a Site Level



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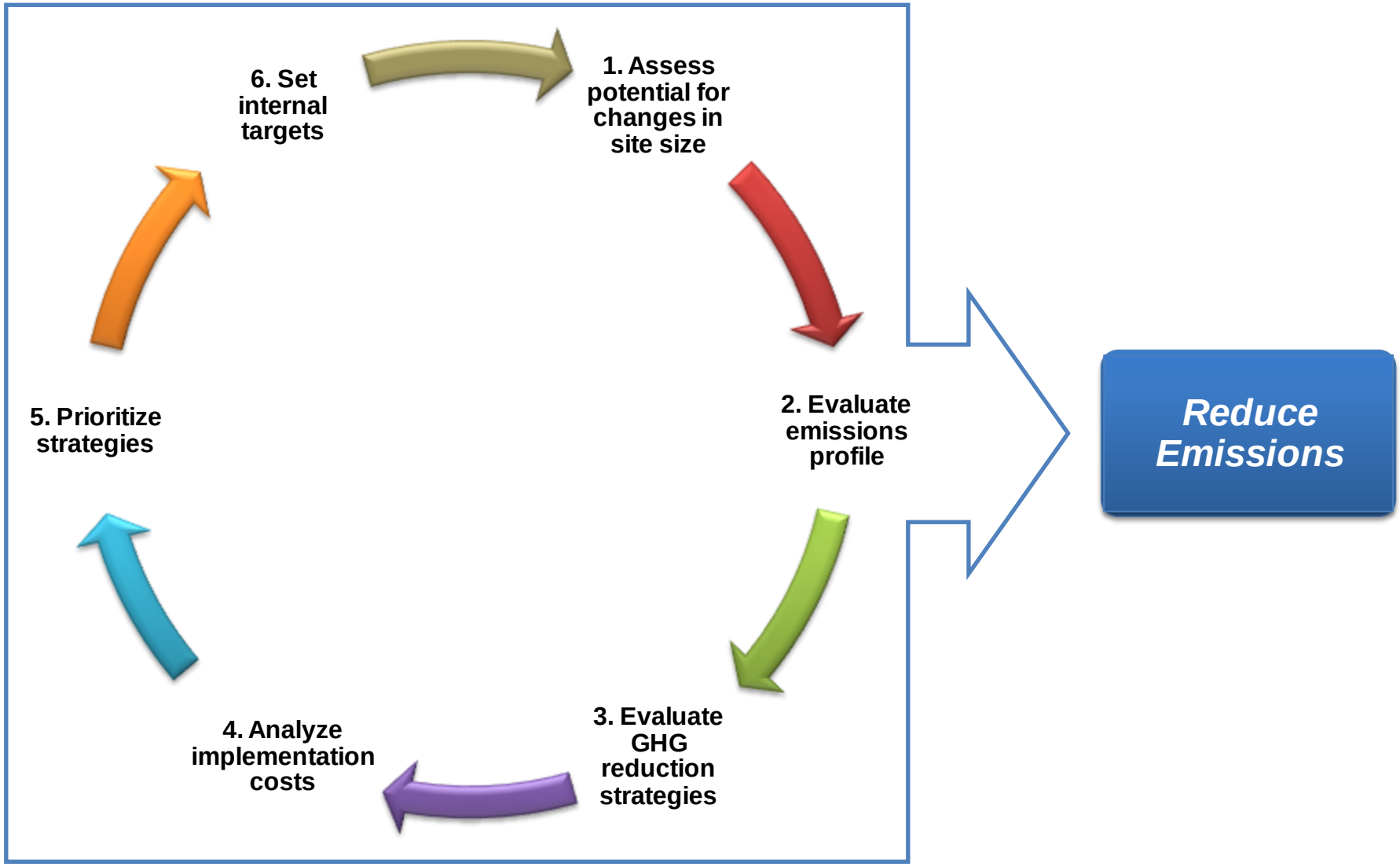
Planning for Scope 3 Emission Reductions



Assess Potential for Changes in Site Size

What are your site's projected Scope 3 emissions?

- Think of your ten year site plan - where will you be in 2020?
  - Number of employees?
  - Changes in work locations?
  - Type of business and expected travel requirements?
  - Changes in energy-intensive equipment use? e.g. computing, lab hoods, electron accelerators
- All else equal, how will that impact your scope 3 emissions?
  - Consider this impact when developing GHG strategies and creating future site sustainability plans

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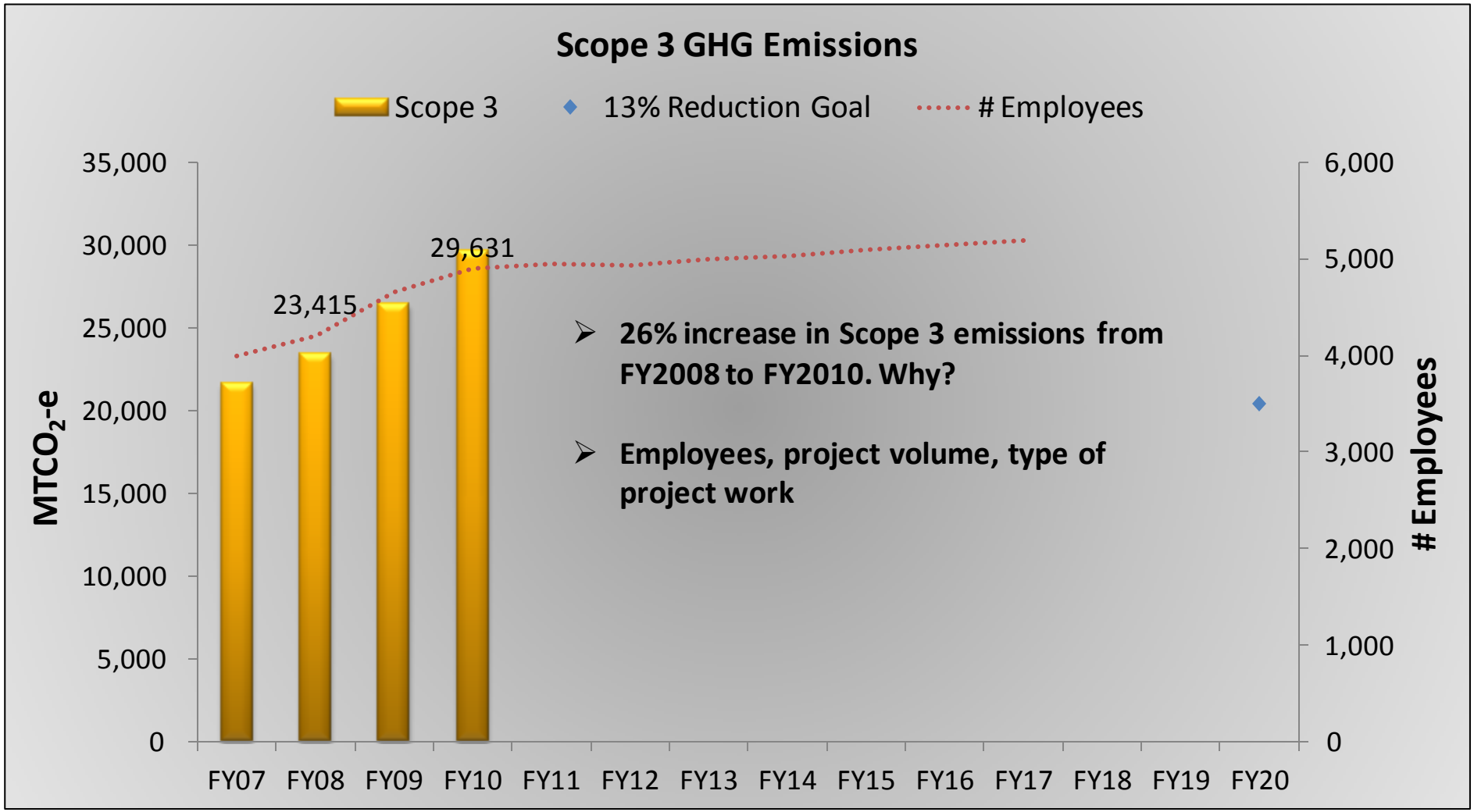
Impact of site changes on Scope 3 emissions - PNNL example

Assess Potential for Changes in Site Size



Evaluate emissions profile

What is your Scope 3 reduction potential?

- What is your detailed baseline performance?
- What are viable alternatives?
- How many may reasonably change behavior?
  - For commute, how many are willing to switch commute modes? Which modes are they likely to choose?
  - For business travel, how many trips may be avoided?
- What is the impact of that changing behavior on the site's GHGs?

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What are the commute alternatives?

Evaluate emissions profile

- Eliminate commute
  - Telework
  - Alternative work schedules
- Travel more efficiently
  - Carpool
  - Vanpool
  - Public transit
  - Bike/walk

Evaluate emissions profile

What information can help estimate commute reduction potential?

- Worksite characteristics that affect commute behavior
- Current employee commute behavior
- Employee commute characteristics and fit with alternatives
- Awareness of alternatives and supporting programs
- Preferences for commuting alternatives
- Barriers to adoption and incentives that best promote alternatives

All but the first are addressed through standard employee commute survey questionnaires

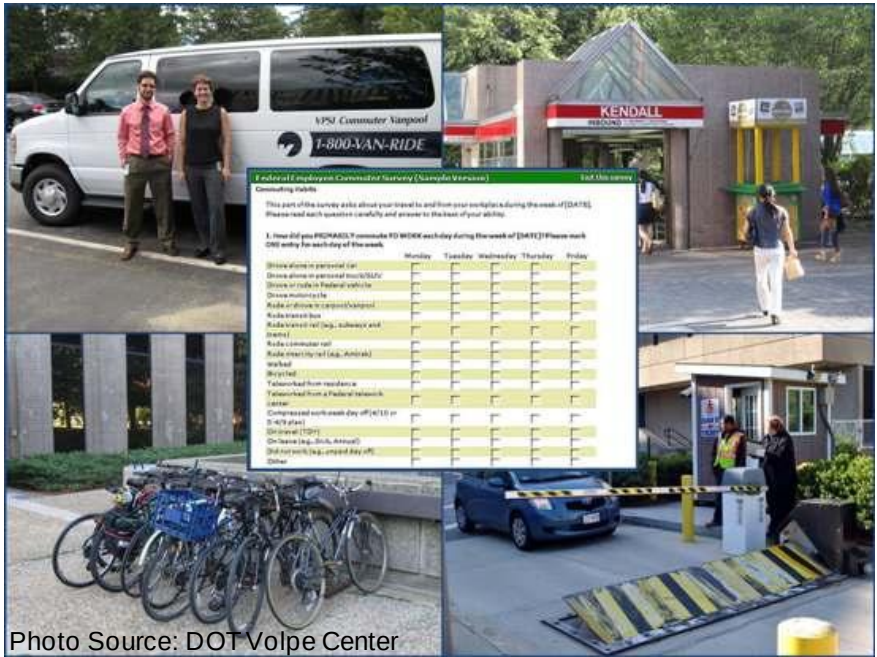


Photo Source: DOT Volpe Center

Evaluate emissions profile

Worksite characteristics that affect commute behavior

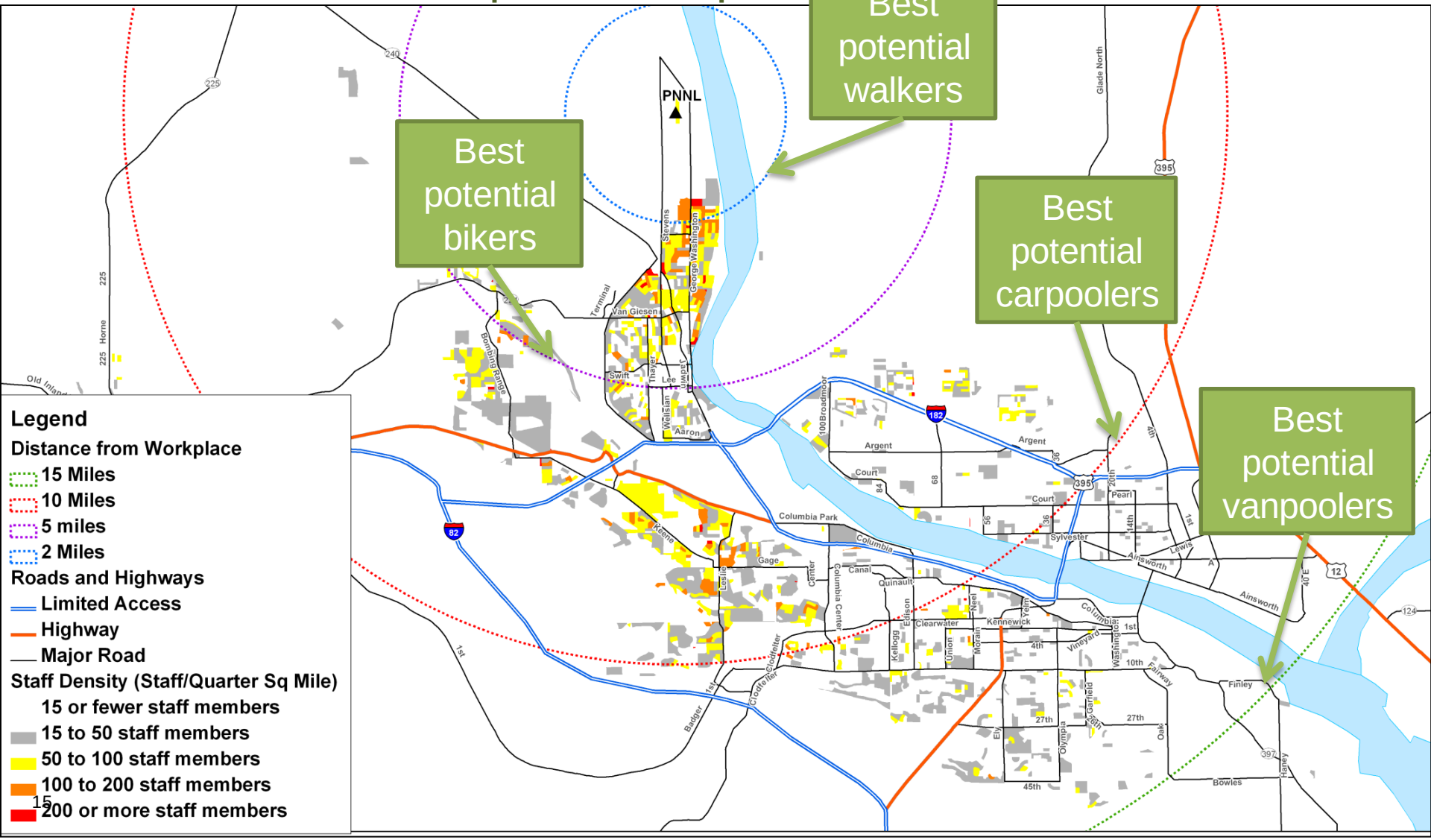
- Understanding key characteristics of major worksites can help determine
  - What alternatives are viable
  - What strategies will effectively promote alternatives

Worksite Characteristic Evaluation Form	
Existing transportation programs/ incentives and participation levels	
Existing mass transit services and proximity to worksite	
Transportation programs of other nearby employers	
Highway access including HOV lanes	
Number, cost, location, supply/demand, and assignment of parking spaces	
Existing bike and pedestrian infrastructure and environment	
On-site transportation need and availability	
Availability of on-site or nearby services	
Current alternative work arrangement policies at the worksite	

Employee location and fit with commute alternatives

Evaluate emissions profile

Example: PNNL Campus



Evaluate emissions profile

How many employees may switch modes?

Example Adoption Rates

Modes	Near-term adoption rate	Long-term adoption rate
Telework	15%	40%
Carpool/vanpool	10%	20%
Bus	5%	15%
Bike/walking	5%	10%
Alternative work schedule	10%	10%

Note: Adoption rate represents range of adoption level (e.g. periodically, frequently, routinely). Staff may us more than one commute mode, e.g. may telework and carpool.

Now, how do you get people to change??

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Evaluate GHG reduction strategies

Strategies to Influence Behavior Change

Communications and Outreach

Encourages behavior change by increasing awareness

Policy/management

Enables behavior change by developing clear guidance and support

Physical and Technological Infrastructure

Enables behavior change by providing needed setting and tools

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Telework Strategies

Evaluate GHG reduction strategies

- Appoint teleworking advocate to coordinate efforts and actively promote teleworking options with managers and staff

- Establish clear guidance and worker-manager agreements
  - Define safety requirements
  - Establish specific grounds for denial/termination of telework
  - Provide training for teleworker and manager

- Implement desktop collaboration tools with video

- Office sharing/hoteling

1&2

1&2 = Scope 1 and 2 reduction benefit

= Supports business travel strategy

Alternative Commute Mode Strategies

Evaluate GHG reduction strategies

- Appoint employee transportation coordinator
- Establish centralized website
- Provide/promote ride-matching support

- Provide partial subsidies/rewards program for alternative commuters
- Establish preferred parking for carpoolers and vanpoolers
- Provide guaranteed rides home

- Provide on-campus transportation (e.g. on call vehicle, shuttle service, bike fleet)
- Expand on-site services such as ATMs, cafeterias, etc.

= Supports Local/Regional planning goal

Commute Example

Prioritize Strategies

What's the most cost-effective way to reduce commute emissions?

- Prioritization approach can vary based on needs/resources
  - rank-ordering of real data with weighted criteria or
  - general assessment of costs and benefits

Scope 3 Reduction Activity	GHG Reduction	Total Cost/ Savings	Cost Effectiveness ($/MTCO$_2$e)	Implement -ation Impact	Weighted Score (100 points)	Overall Rank
Telework program						
Alternative work schedule program						
Bus program						
Carpool/Vanpool program						
Bike/walk program						

Prioritize Strategies

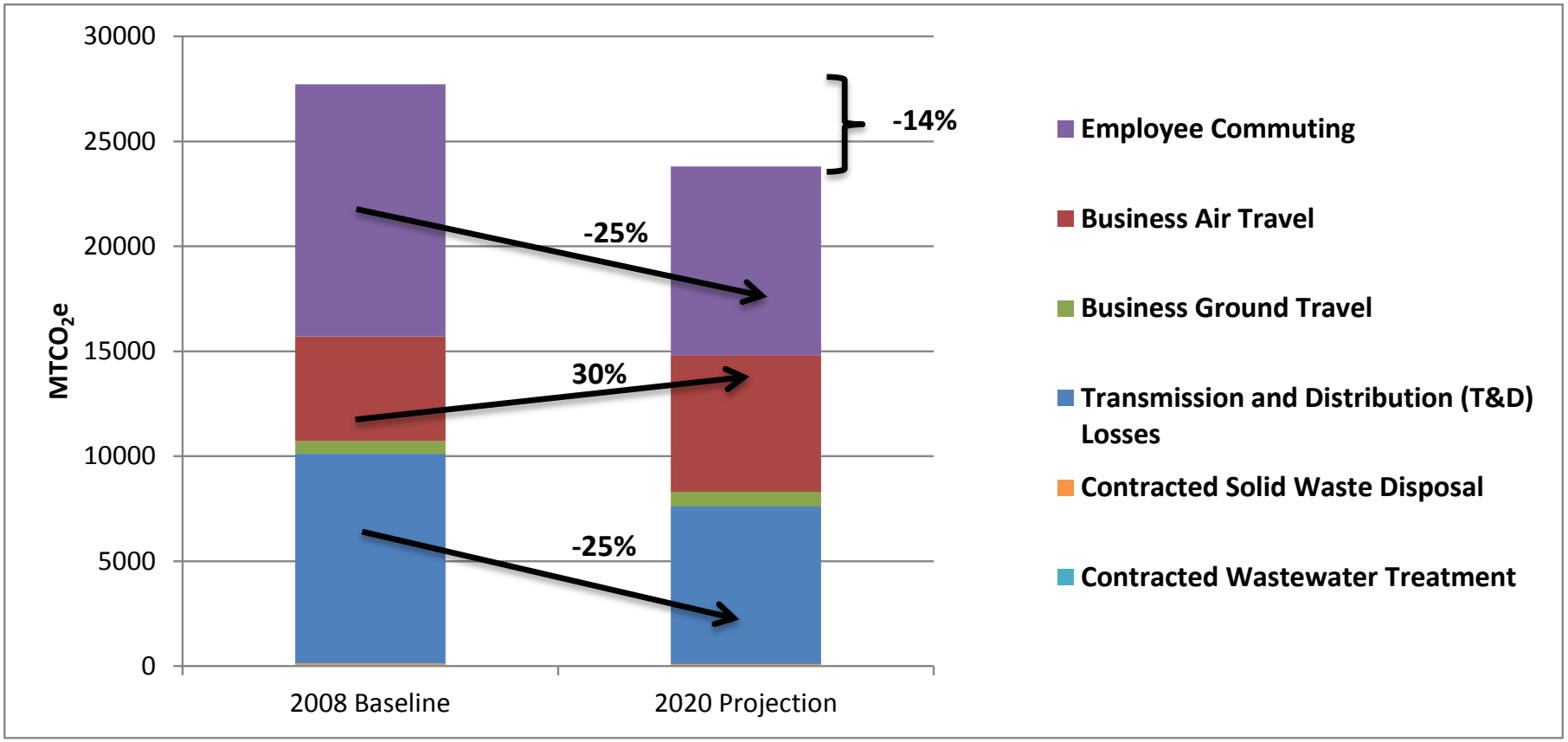
What's the most cost-effective way to reduce all Scope 3 emissions?

- Prioritize across all scope 3 reduction actions based on resources available

Scope 3 Reduction Activity	GHG Reduction	Total Cost/ Savings	Cost Effectiveness ($/MTCO$_2$e)	Implement -ation Impact	Weighted Score (100 points)	Overall Rank
Telework program						
Alternative work schedule program						
Bus program						
Carpool/Vanpool program						
Bike/walk program						
Business travel						
MSW reduction						
T&D losses (resulting from planned scope 2 actions)						

What percent reduction from our baseline can we achieve?

Set Targets



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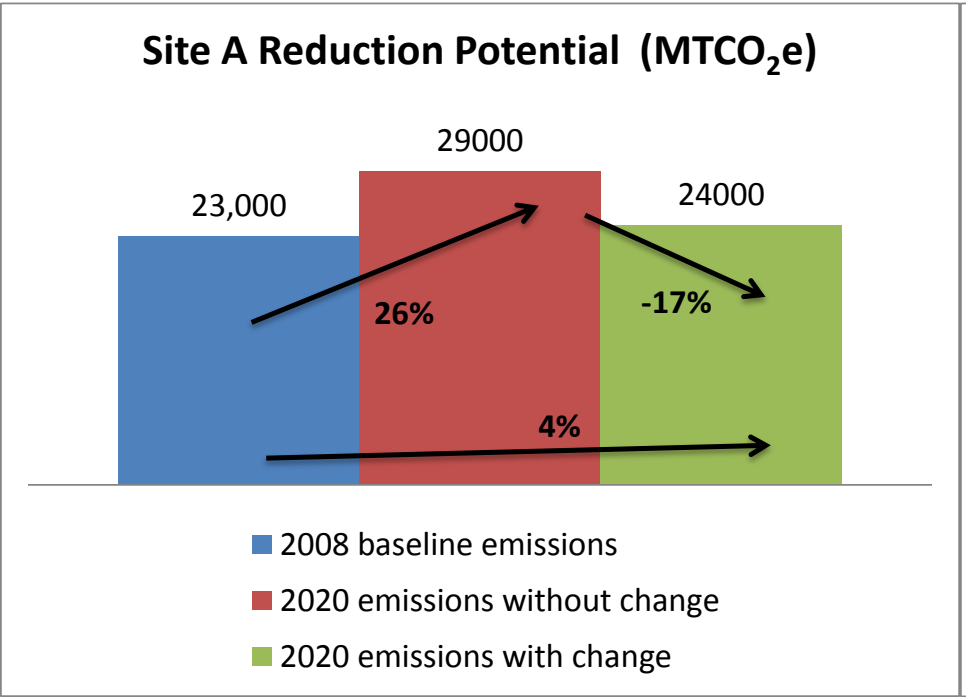
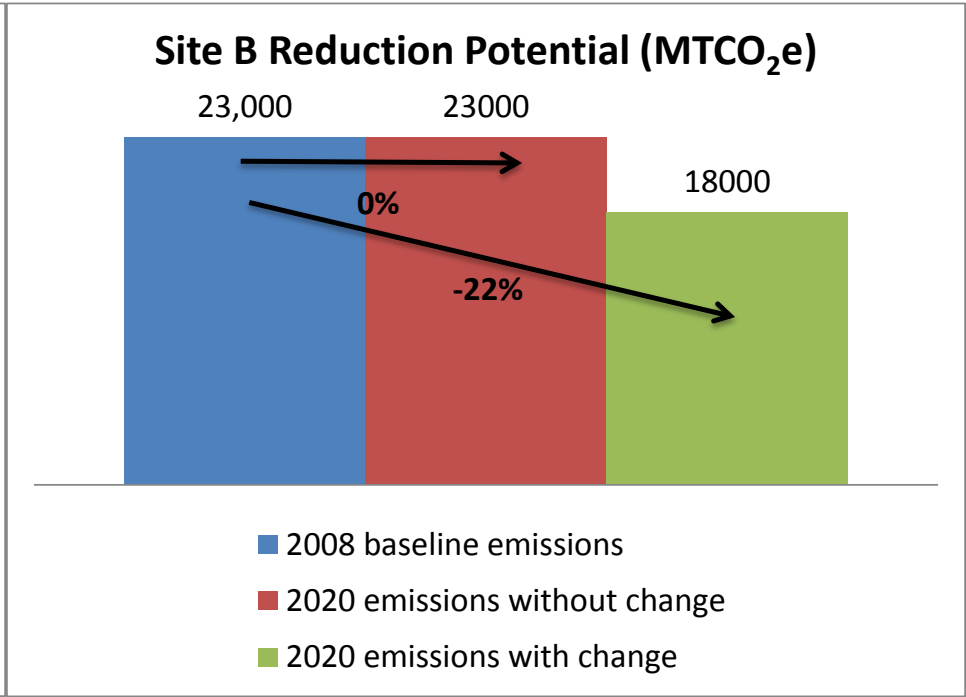
What percent reduction from our baseline can we achieve?

Set Targets

- How will that portfolio of projects affect reduction targets?
- Each site's growth trajectory will influence the percent reduction from baseline that's achievable





From Planning to Action

Reduce Emissions

- Develop a timeline based on prioritized strategies
- Identify responsible parties for implementing strategy
- Identify metrics to track progress against target
- Engage leadership to encourage behavior change across all levels of the site
- Re-evaluate strategies periodically and adjust plans based on actual progress

- Report success stories!

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Telework Success Story
NREL Telework Program

Reduce Emissions

Actions taken

- Staged approach with pilot project
- Created a Commuting Council with high level representation from across lab
- Voluntary and privileged (not entitlement) program based on individual manager/supervisor support
- Attended all hands and group level meetings to announce and explain program
- Offer behavior change training in-person and Webinars: measuring employee performance, telecommuting training, manager/supervisor training
- Offer IT training and support
- Created collateral educational materials (including telecommuting agreement)
- On-going challenge is determining who telecommutes on what days in order to maintain necessary level of support

Impact

- ~19% of employees telecommute at least one day per week (goal is 25%)
- Additional ~5% telecommute "occasionally"
- Telecommuting as percentage of daily commute trips increased from 1% to 5% (from 2007)
- ~25% of employees use AWS
- Additional untapped demand for telecommuting and AWS (based on survey comments)
- Commuting emissions decreased by 15% per capita since 2008

Alternative Commute Modes Success Story
ORNL Commute Options Program

SUSTAINABLE CAMPUS INITIATIVE

Reduce Emissions

ACTIONS

- Developed an ORNL Commute Options homepage and a marketing campaign
- Formed ORNL Transportation Council
- Promoted Alternative Work Hour Arrangements
- Distributed information in employee orientation materials
- Created strong regional partnerships
- Partnered with SmartTrips for commute promotional materials, Transportation Fairs, Emergency Ride Home, carpool matching services
- Vanpool Services Inc. (VPSI) participated in three ORNL Commute Alternative promotions
- Participated on the Knoxville Regional Transit Development Plan Committee

IMPACT

- Commute Options Eliminated 410 MTCO2e
  - Carpools and Vanpools (80 employees) eliminated an estimated 636,872 miles of commute travel annually eliminating 278 MTC02e.
  - Alternate Work Hours (AWH) (237 employees) reduced 310,458 vehicle miles of travel (VMT) and 132 MTCO2e.
- Participation in Smart Trips "Commuter Challenge" increased 13%. ORNL jumped from 4th to 2nd place among region's largest organizations. Awarded the 2011 Smart Trips "Green Spirit" award.

*Source for Emission Factors: DOE Office of Science Strategic Sustainability Program Plan, 2011

Summary

- Scope 3 priorities will vary by site
- Data required for reporting isn't usually enough to make informed decisions about managing emissions
- Develop a more detailed understanding of emission sources that matter most to your site
- Consider changes in size of site and mission requirements
- Establish a portfolio of projects that will most cost-effectively get you to your Scope 3 target

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Looking Ahead - Training Development and Deployment

- Scope 3 training developed at the request of the HSS Office of Sustainability Support
- HSS and its partners will adapt this Scope 3 training for use in multiple formats
  - On-demand web training
  - On-site workshops
- Scope 3 training will also be supported by decision-making tools and reference documents
  - Provide framework and resources for site level or portfolio planning and implementation
- Scope 3 training is intended to reinforce a broader suite of sustainability training materials and information
  - Link existing material with newly-developed content
  - HSS wants to know: what are your needs?

Thank you!

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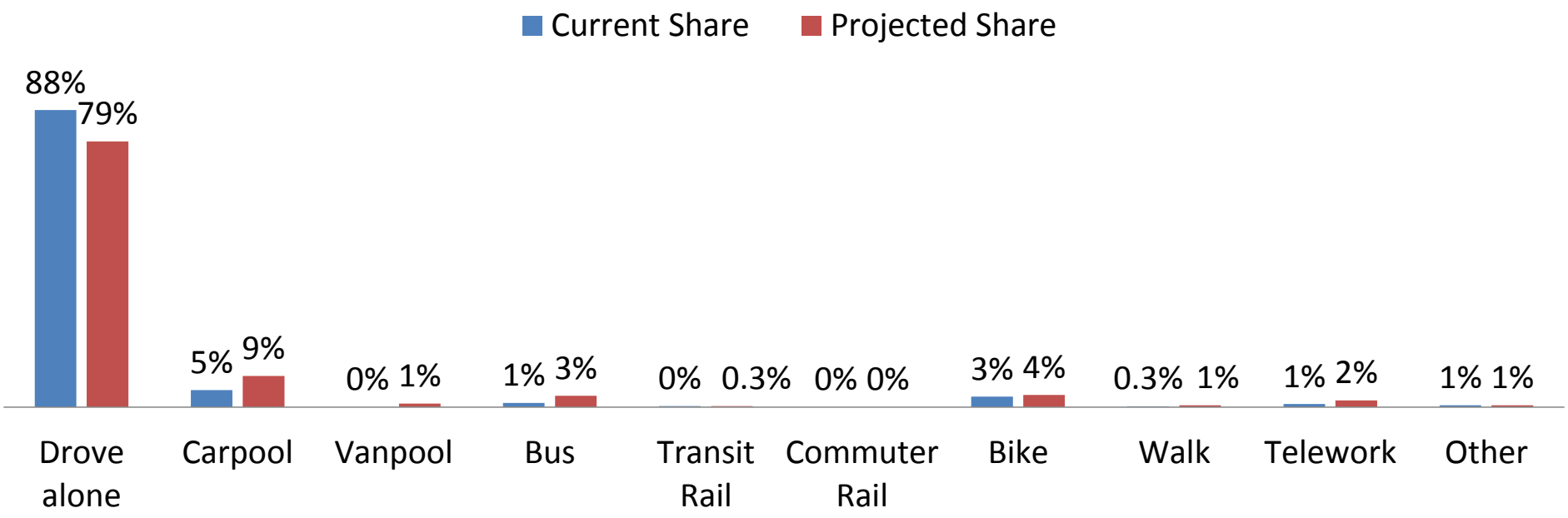
Backup slides

Evaluate emissions profile

Commute – Current commute behavior

- Analysis of current commute behavior at worksites helps:
  - Establish a baseline for comparing future performance
  - Measure effectiveness of trip reduction strategies over time

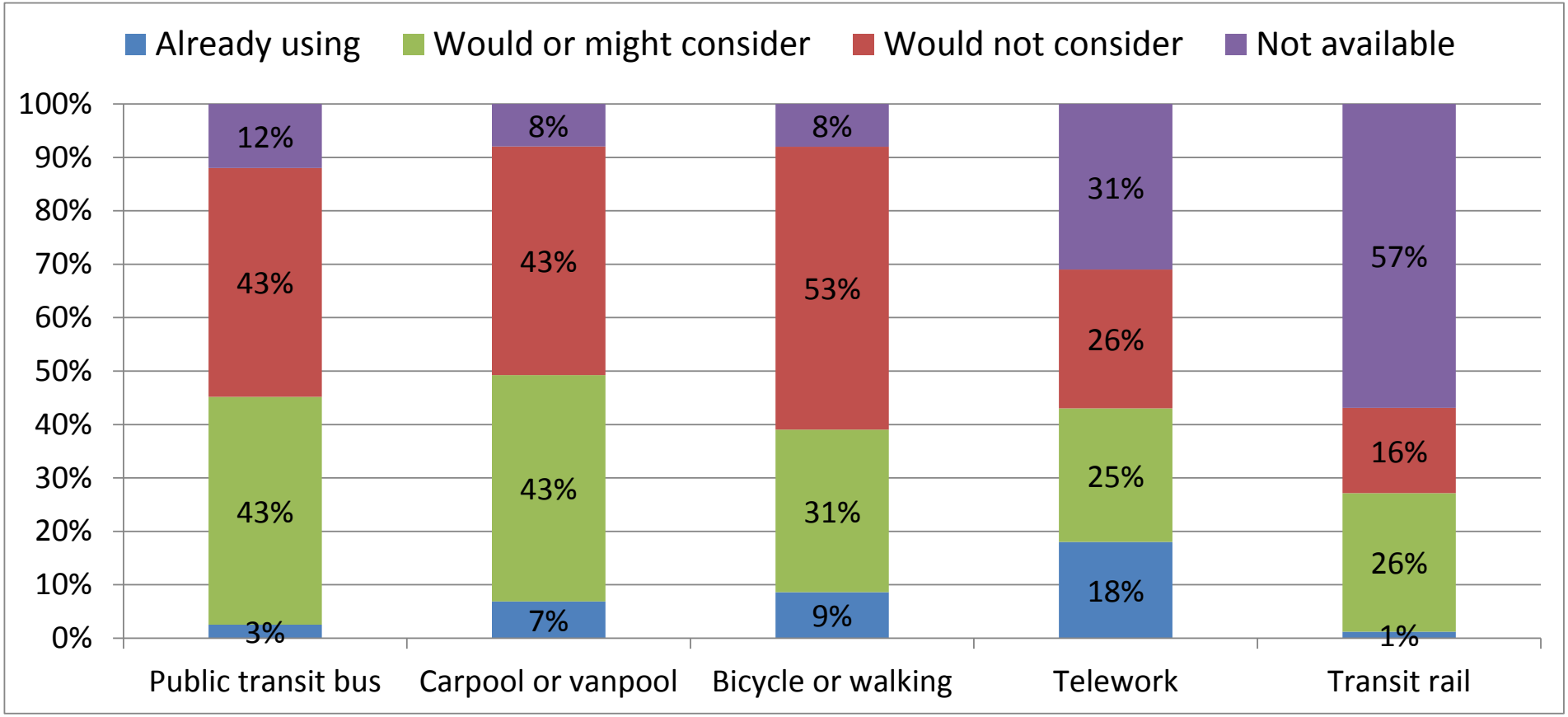
PNNL Example



Commute – Preferences for alternatives

Evaluate emissions profile

PNNL Example



High interest & low current adoption

Low availability, but high interest

Commute - Determine barriers and identify options and incentives

Evaluate emissions profile

Reasons Staff Drive Alone:

- Irregular work schedule
- Need to run errands before or after work
- Need my car at work for business
- No reasonable transit options
- Need car in case of emergency
- Don’t have anyone to ride with

Options to address:

- Telework, AWS
- Telework, AWS, bring more amenities to campus
- Provide on-campus shuttle service
- Improve availability of all options
- Provide guaranteed ride home
- Improve access to vanpool/carpool options

Evaluate emissions profile

Commute - Use collected information to estimate adoption rates

PNNL Example

- Telework example summary:
  - Telework is available for 25% of employees and policies exist but are not widely known
  - Low number of current, regular users (4%)
  - High number of current, periodic users (18%)
  - High level of interest in future use
  - Management decisions mean that telework not *currently* an option for some employees.

- Telework example adoption rate estimate:
  - Near term adoption rate increases to 15%
    - Need near term policy/culture change
  - Long term adoption rate increases to 40%
    - Build momentum into future years

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Analyze Implementation Costs

What are the costs, savings, and other impacts?

- Evaluate costs and benefits of implementing each alternative:
  - First cost
  - Operating costs and savings
  - GHG reduction impact
  - DOE mission impact
  - Employee impact
  - Community impact
- Consider that costs for some activities (e.g. guaranteed ride home), will benefit multiple programs (e.g. bus promotion program, carpool program)

Evaluate emissions profile

Business Travel – What are the alternatives?

- Eliminate travel, as possible
  - Use videoconferencing and other collaboration tools
  - Work with clients to help determine when alternatives to travel are an option and when they are not
- Travel more efficiently
  - Consolidate trips
  - Higher efficiency ground travel options

Business Travel – What information can help define best path forward?

Evaluate emissions profile

PNNL Example: Trips per Traveler

Metric	FY08	FY10	% Change
Total round trips	14,005	19,759	41%
Trips per traveler*	6.0	7.1	18%

*~60% of staff reported traveling for business in 2010 an avg of 14 days/yr

Proportion of Travel by Project Type

Project Type	% of Total Travel Cost
DOE - Nuclear Nonproliferation	26%
DOE - Energy	10%
DHS	9%
DOE - Science	6%
Special Programs	6%
All others	15%
Indirect	27%

Top Travel Destinations

City Name	% of Total Miles	% of Total Trips
DC	15%	14%
Seattle	1%	8%
Denver	1%	3%
San Francisco	1%	3%
Baltimore	2%	2%
International	42%	19%
All others	*37%*	*51%*
Total	**100%**	**100%**

Business Travel - Estimate Reduction Rates and GHG impact

Evaluate GHG reduction strategies

PNNL Example

Target Areas		Near Term Reduction in % of Trips	% Reduction in Business Travel GHG	Long Term Reduction in % of Trips	% Reduction in Business Travel GHG
Reduce indirect travel	Research Org Indirect Travel	2%	-4% from FY10 +26% from FY08	10%	-16% from FY10 +11% from FY08
	Overhead Org Indirect Travel	10%		20%	
Reduce direct travel	Project work with established clients	5%		25%	
	Project work with all other clients	1%		10%	

Strategies to Reduce Business Travel

Evaluate GHG reduction strategies

- Site-wide communications campaign at all levels in the organization – senior management, project manager, employees

- Revisit travel approval policies to ensure effectiveness
- Make higher efficiency vehicles the default rental vehicle choice

- Establish high-end videoconferencing solutions for frequently-traveled destinations

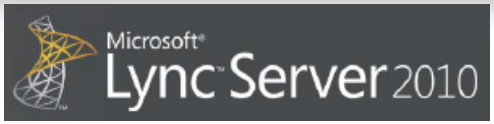
- Implement desktop video/telepresence options

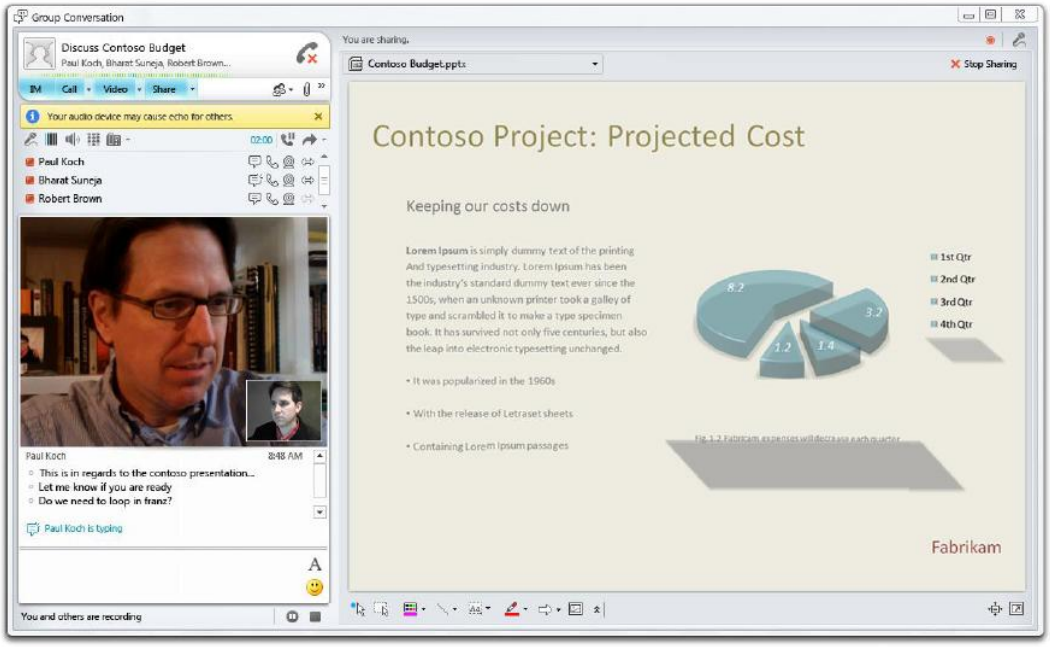
= Supports commuting strategy

Business Travel - Example Technology Solutions

Evaluate GHG reduction strategies

http://www.cisco.com/en/US/products/ps10753/index.html





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Evaluate GHG reduction strategies

T&D Losses & Contracted Wastewater Treatment

- T&D Losses
  - Any activity that reduces electricity consumption will reduce emissions from T&D losses
    - Conservation, efficiency projects
  - Onsite renewable energy projects
- Contracted wastewater treatment
  - Emissions are a function of the number of employees – difficult to reduce unless #staff is reduced
- Contracted solid waste disposal
  - Pollution prevention strategies to reduce waste will result in emission reduction

1&2 = Scope 1&2 reduction outcome

= Supports 50% waste reduction EO goal

Reduce emissions

Waste Reduction Success Story

- Sandia - “Life cycle of a cafeteria”
  - Rolled out composting program at the Thunderbird Café, the site’s largest cafeteria serving 1,200 patrons per day
  - Diverted over 15,000 pounds of food waste in FY10
  - Set up additional recycling bins
  - Composting contract written into vendor support for special events
  - Introducing compostable plastics based on top 5 items contaminating compost stream

 www.hss.energy.gov/sesa/sustainability/pp/data_entry/pptrs/d_accomp_r.aspx?id=742