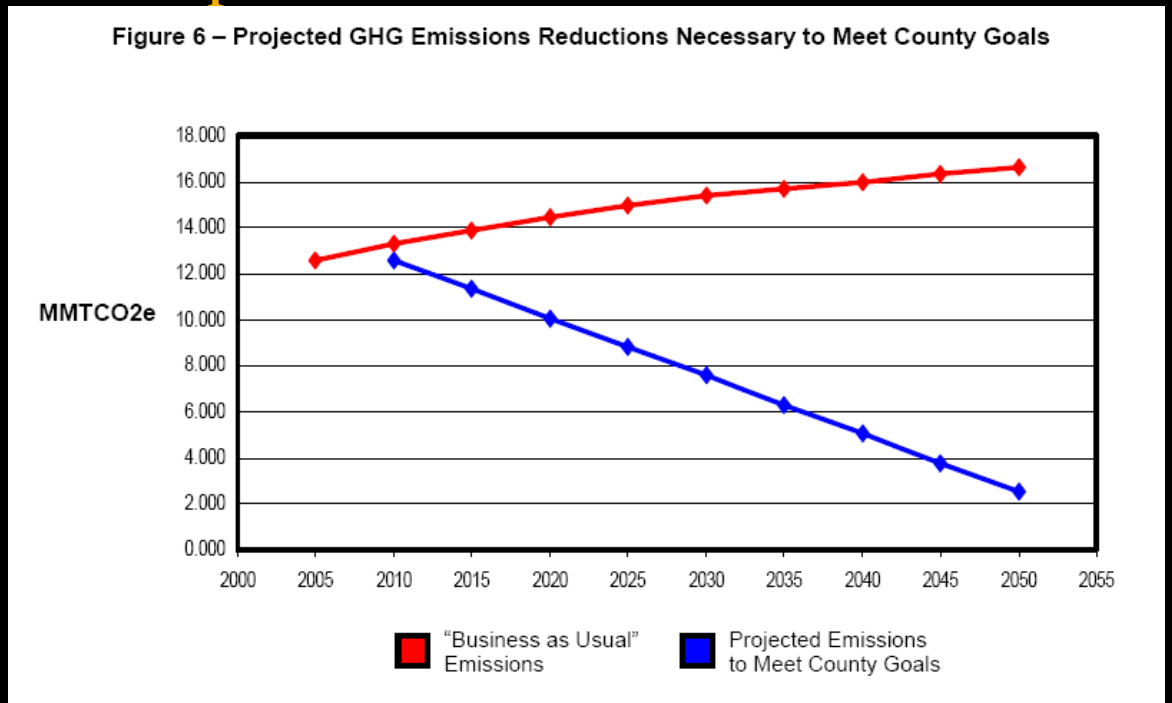
Carbon Modeling in the Germantown Sector Plan

Germantown CAC Meeting

4/21/2009

Germantown Carbon Modeling

- Carbon Footprint Analysis required by Code
- County Code also mandates Climate Protection Plan, now under review.
- Carbon modeling one part of overall effort aimed at climate protection



Germantown Carbon Modeling Methodology

- Spreadsheet model developed by King County, Washington.

- We are coordinating with MCDEP

The model considers:

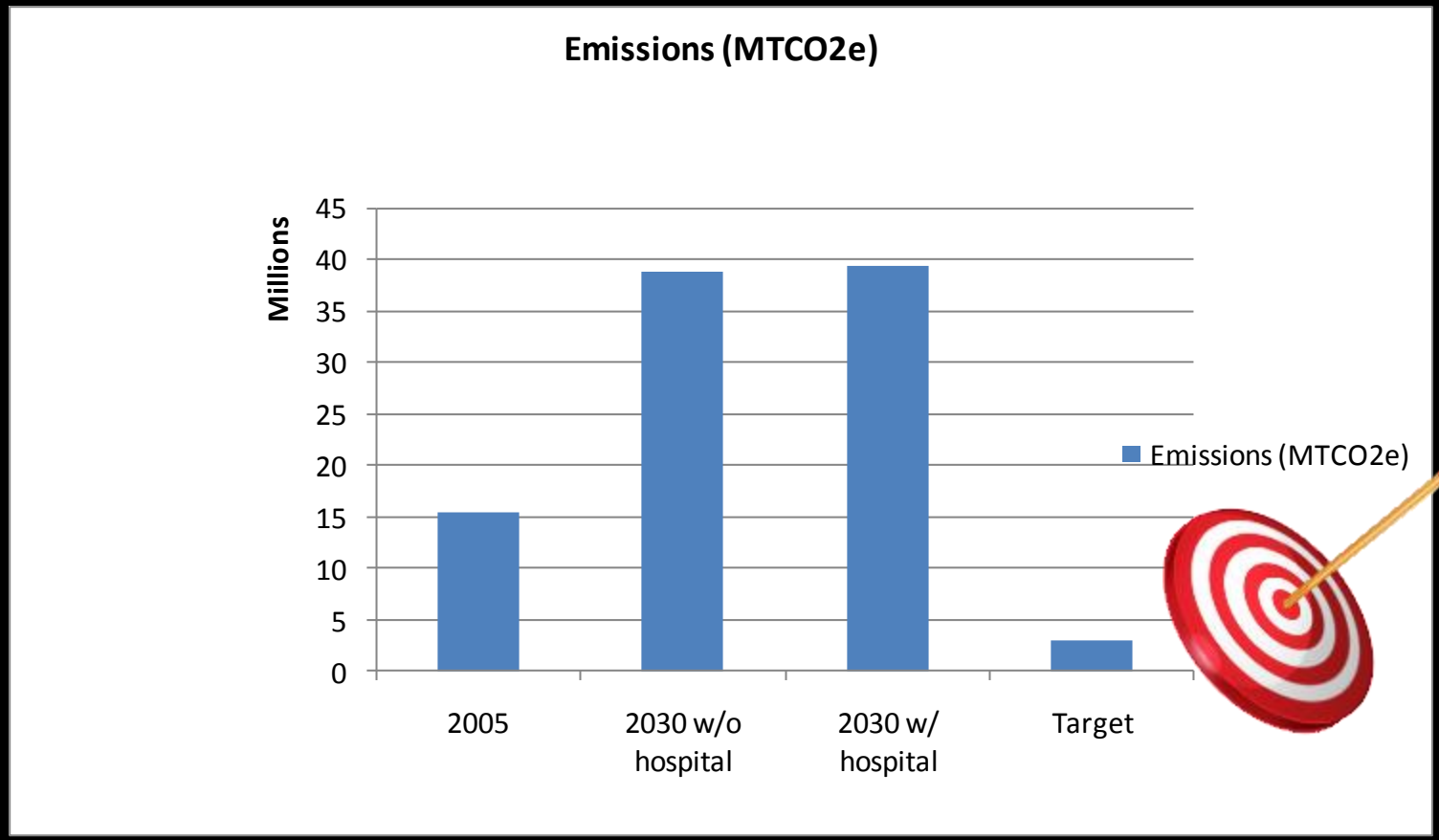
- Carbon from materials production
- Energy emissions from buildings
- Transportation energy emissions

Germantown Carbon Modeling Methodology

Assumptions

- Estimates emissions
- Based on “current practice”
- Results (outputs) are for life cycle of the development
- Results are for a given Master Plan or Sector Plan area

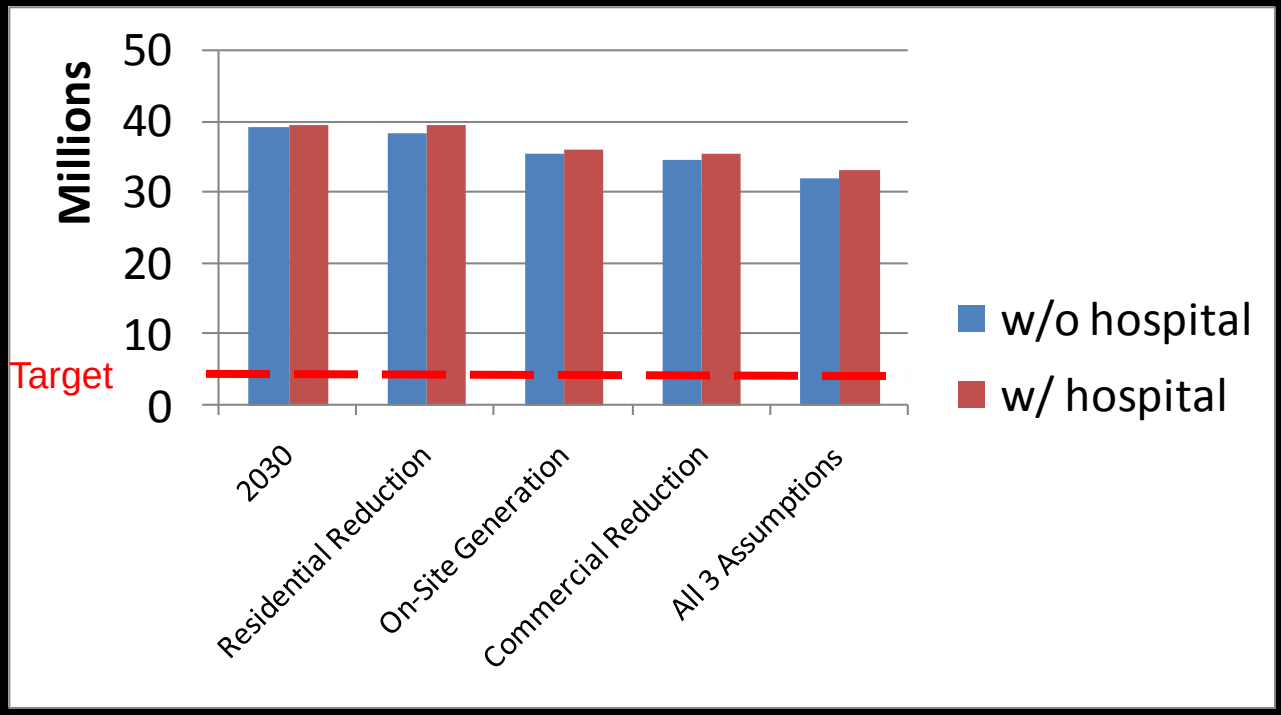
Germantown Carbon Modeling – Gross Results



Germantown Carbon Modeling – Reduction Scenarios

1. 50% of residences reduce energy by 25%
2. 25% increased energy efficiency for commercial buildings
3. 20% renewable energy onsite for commercial buildings

Germantown Carbon Modeling – Reduction Scenarios



Germantown Carbon Modeling – Response

- Minimize carbon emissions
  - Energy efficiency
  - Renewable energy
  - Non-auto transportation
  - Increase tree canopy

Germantown Carbon Modeling

How do we protect the environment?

- Compact, transit-oriented neighborhoods with a diversity of land uses
- Connect within and between communities
- Green site and building design
  - Increase vegetation
  - Increase energy efficiency
  - Increase renewable energy use
  - Minimize pavement, reduce heat island
  - Save/reuse water
- Buy local, recycle

Germantown Carbon Modeling Methodology

Embodied Energy Emissions

Embodied Emissions Factor*
X Units or Building Sq. Ft.
+ Sq. Ft. Pavement

Lifespan Energy Emissions

*From Athena Eco-calculator; Calculates average greenhouse warming potential in columns and beams, floors, windows, interior and exterior walls, roofs

Germantown Carbon Modeling Methodology

Building Energy Emissions

Building Energy-related Emissions Factor*
(MTCO2e/thousand sq. ft.)
X Average floorspace/building or unit

Lifespan Energy Emissions

*Uses average building energy consumption, carbon coefficient for buildings, building size or unit type

Germantown Carbon Modeling Methodology

Transportation Energy Emissions

Vehicle-related Carbon Factor*
(MTCO2e/person/year)
X average people/unit or building

Transportation Emissions

*Uses average VMT/person/year, average vehicle fuel consumption, emissions/gallon fuel burned