

# Sources of Greenhouse Gas Emissions Under SEPA: Considering What to Measure

SEPA IWG

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# Overview

- Sources of emissions being considered
- Criteria for considering what to measure
- Test case overview
- Test cases:
  - County Comprehensive Plan
  - Transportation Project: Widening County Road
  - 75 Acre Timber Sale
  - New Construction: Big Box Store

# Sources of Emissions Being Considered

## **Direct Emissions**

1. Direct Construction
2. On-Site Mobile Sources and Company Owned VMT.
3. Stationary Sources and Direct Facility Emissions
4. Fugitive Emissions
5. Direct Agricultural Emissions
6. Forestry Conversion and other land or Aquatic Vegetation Disturbance
7. Direct emissions from maintenance activities

## **Indirect Emissions**

1. Off-Site Extraction of Purchased Materials
2. Off-site Processing of Purchased Materials
3. Transportation of purchased materials by Non Company Owned Transport
4. Employee Commute VMT
5. Other Indirect VMT
6. Purchased electricity
7. Water Use and Off-Site Wastewater Disposal.
8. Off-Site Solid Waste
9. Off-Site End-use emissions from use of proponent's products sold to others

# Criteria for Considering What Emissions Sources to Measure

- Has the source of the emission for this proposal been addressed (analyzed and mitigated) in another SEPA document, or local, regional, or state plan?
- Can the source be credibly measured or assessed (quantified or otherwise) with the tools/information currently available?
- Can the boundary (scope or scale) of the emission be determined?
- What is relative importance (regionally, nationally or globally) of the contribution of this emission source to climate change impacts?
- Can the proposal be modified to avoid, minimize or otherwise mitigate its contribution of this emission source?

# Measurement Test Cases

## Completed test cases:

- \*County Comprehensive Plan
- Regional Transportation Plan
- \*County road widening that also fills in a wetland
- \*75 acre public timber sale (not conversion)
- \*Typical suburban project (e.g., office park or big box retail)
- Expansion and reconfiguration of existing port terminal
- Relocation of business in Seattle (30,000 sf warehouse)

## Not completed:

- Major mixed use residential, office, commercial redevelopment
- Rezone, rural agricultural to commercial or light industrial zoning
- Short plat subdivision (rural)

\*Case study for presentation

# County Comp Plan Test Case

- Example Comp Plan:
  - Populous, growing, well-funded GMA county updating its 5-year Comp Plan
  - County is already doing a PSRC-style regional transportation model
  - Considerable redevelopment to new residential and commercial
  - Considerable “loss of sink” by forest loss and conversion of vegetated land.

# County Comp Plan Test Case

- **Direct Emission Sources (County-owned)**
  - County-owned construction: **Yes**, but small and hard to mitigate
  - County-owned stationary sources: **Yes**, but minor fraction of County-wide total
  - County-owned VMT: **Yes**, but minor fraction of County-wide total
- **Indirect Emission Sources (Community)**
  - Embodied emissions in purchased goods: **Questionable (?)**, easy to roughly calculate, but hard to mitigate.
  - Indirect community VMT: **Yes**, already calculated, can be mitigated through stringent trip reduction requirements.
  - Purchased electricity and natural gas: **Yes**, can be calculated, can be mitigated through energy standards.
  - Water/Wastewater emissions: **No**. Can be calculated, but few mitigation options by County and community.

- Indirect (Cont'd)

- Solid waste emissions: **Yes**; can be calculated; County could enact stringent waste reduction requirements for new development
- Forest/vegetation loss: **Yes**; can be calculated; County could enact stringent re-forestation requirements for new development
- Off-site end use of purchased/manufactured products: **No**; hard to calculate, few mitigation options by County.

# County Comp Plan Test Case

- Insights

- Direct (County-owned) emissions easily calculable and mitigable, but a tiny fraction of overall emissions.
- Some categories of indirect (Community) emissions (including regional VMT) can be calculated by a well-funded county, and certainly mitigated by development standards.
- Loss-of-sink forest loss can be calculated by a well-funded county, and maybe mitigated by development standards.
- Embodied emissions from purchased products is “on the fence”
- Some indirect categories (water, wastewater, end-use of products) are difficult to measure and mitigate even for a well-funded county.
- Clearly, less-funded rural counties would have much more difficulty doing the calculations and developing mitigation measures.

# Transportation Project Test Case

- Project:
  - Widening a county road from 2 lanes to 4 lanes
  - Project a response to growth in the area
  - Project requires filling in a wetland

# Transportation Project Test Case

- Direct Emission Sources
  - Mobile sources: vehicles traveling on roadway
  - Construction: emissions during construction from construction equipment and/or traffic congestion
  - Maintenance: emissions during maintenance of roadway (roadway maintenance currently exempt from SEPA, WAC 197-11-800)
  - Wetland removal: wetland required to be mitigated
- Indirect Emission Sources
  - Materials used: emissions from materials extraction, processing, and transportation
  - Induced growth: area growth due to improved transportation

# Transportation Project Test Case

- Insights
  - Very difficult to determine GHG emissions from single project due to network nature of transportation system.
  - Not possible to account for induced growth at project level.
  - GHGs emitted by traffic using roadway are much greater than other emission sources related to project (construction, maintenance, etc.).
  - Wetlands currently require mitigation; how does that mitigation affect GHG balance from wetlands removed and mitigated within a project?

# Transportation Project Test Case

- Insights, con't.
  - Little can be done at the project level to change a transportation project's GHG emissions.
  - At what point are decisions made about which projects are pursued? About the type of transportation system developed?
  - How can we evaluate GHG emissions to aid in the decision making process?
  - If transportation GHG emissions are evaluated in a larger context, what type of analysis is appropriate at project level?

# Timber Sale Test Case

- Project
  - Clearcut harvest on 75 acres in a state forest
  - Road construction using existing or new nearby rock pit
  - Small amounts of burning
  - Transport to mills
  - Does not include milling or lumber use

# Timber Sale Test Case

- Direct Emission Sources
  - Construction: road building and rock extraction/loading eqpt.
  - Mobile Sources and Direct VMT: log and rock hauling, loading and harvesting machinery
  - Forestry Conversion and Vegetation Disturbance: temporary tree loss and landing clearing; potential new road
  - Maintenance: fertilizers or pesticides
- Indirect Emission Sources
  - Extraction of materials: rock extraction and loading equipment (or belongs in construction above)
  - Employee commute VMT
  - Solid Waste: Logging slash (if burned)
  - End-use Emissions: *(milling, lumber transport and use, add'l wood waste; not considered in this proposal)*

# Timber Sale Test Case

- Insights
  - 2 month project every 60 years
  - Does not appear to be an important source of GHG emissions
  - As part of forest management, may be a very “green” activity
  - How do we recognize Forest Planning at project level?
  - Do we compare to 1990 levels or ?
  - Which category do some of these measurements belong?
  - What is the boundary for this project?
  - Filling out the matrix is very informative
  - A conversion would be a very different set of impacts  
( permanent loss of carbon sink)

# Retail Center Test Case

## Project

- Big box store “supercenter”
- Undeveloped land (could be in UGA)
- Wetland filling and on flood plain
- Near highway, new off-ramp, access road, parking lot,
- Onsite wastewater treatment
- New water supply and new power lines,
  - Employees will travel 10-30 miles to work
- Mix of company-owned and other transportation of retail goods and other materials

# Retail Center Test Case

## **Direct Emissions**

- Construction (land clearing, paving, buildings)
- Transportation (shipping of products)
- Stationary sources/facility emissions (cooking facilities, back-up electrical generation)
- Fugitive emissions (hydrofluorocarbons from refrigerants during operation and disposal)
- Land and aquatic vegetation conversion
- Maintenance activities (landscaping, repaving, painting)

# Retail Center Test Case

## Indirect Emissions

- Extraction of materials (steel, cement wood, plastic structures and products)
- Processing of materials (products and packaging with plastics, metals, wood)
- Transportation (materials, products, employees, customers, traffic pattern changes)
- Energy use (electrical, heating)
- Water use and wastewater disposal (water delivery, on-site wastewater)
- Solid waste (packaging, food, paper and plastic disposables, hazardous waste, hauling)
- End-use emissions from product use (propane, generators, other combustion appliances/equipment)

# Retail Center Test Case

## Insights

- almost all sources of emissions are applicable to this proposal
- qualitative assessment is available when calculation tools are not
- probable *determination of significance* due to other impacts
- transportation emissions are important both direct and indirect
- mitigation is available for all applicable emission sources