

**Energy Use  
and  
Greenhouse Gas Emissions  
in  
Los Alamos County  
2000-2019**

Study performed and presented by  
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to  
Environmental Sustainability Board  
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**Purpose: Provide Database for Change**

- Identify the leverage
- Baseline for measuring progress
- Historical; no solutions
- LA County exclusive of LANL.

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**Primary Energy Use in LA Comes from  
3 Sources**

- Natural Gas
  - 1 therm = 100,000 BTU = 105.5 MJ =  $1.055 \times 10^{-4}$  TJ
  - Data sources: LAC DPU
- Electricity
  - 1 kWh = 3.6 MJ
  - 1 MWh = 3,600 MJ =  $3.600 \times 10^{-3}$  TJ
  - Data sources: LAC DPU, DOE EIA
- Petroleum Fuels
  - 1 gal = 1,330 MJ (average) =  $1.33 \times 10^{-4}$  TJ
  - Data sources: NM TRD, LAC DPW, LAPS, Private vendors

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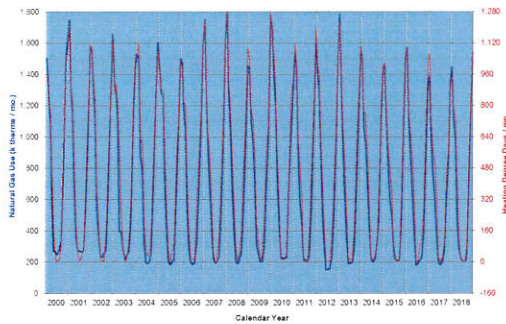
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Fig. 2.1A. Monthly Natural Gas Use Correlated to Heating Degree Days




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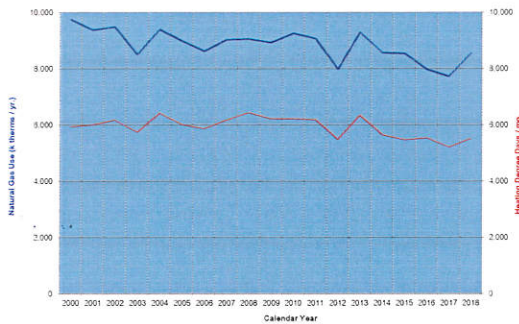
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Fig. 2.1B. Annual Natural Gas Use Compared to Heating Degree Days




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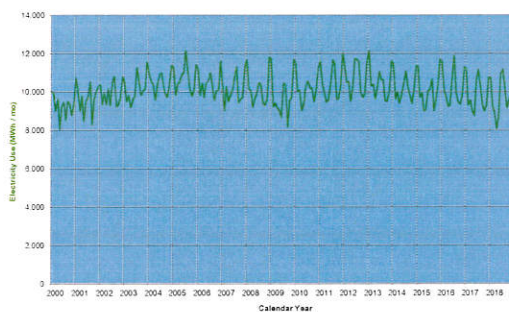
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Fig. 2.2A. Monthly Electricity Use




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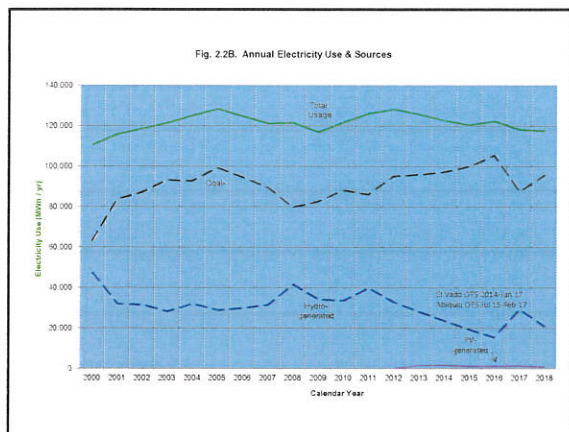
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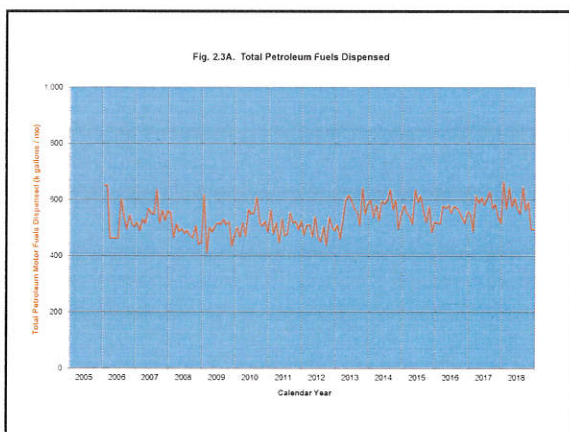
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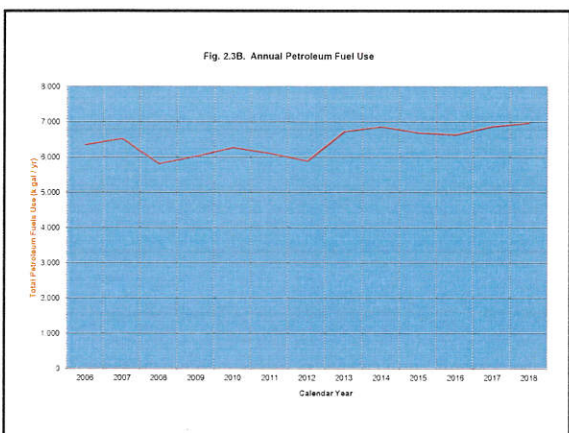
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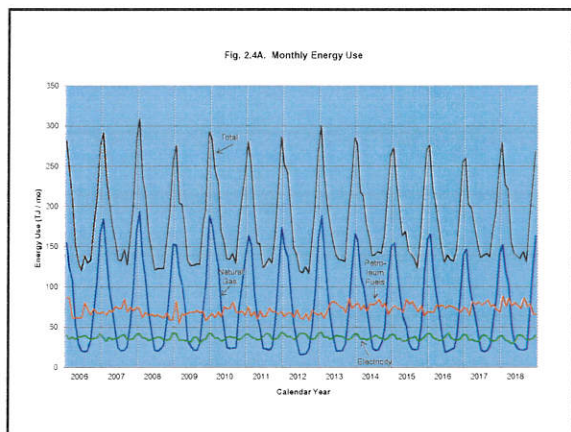
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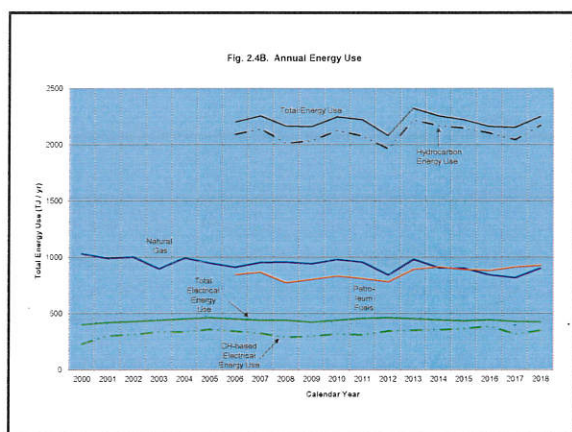
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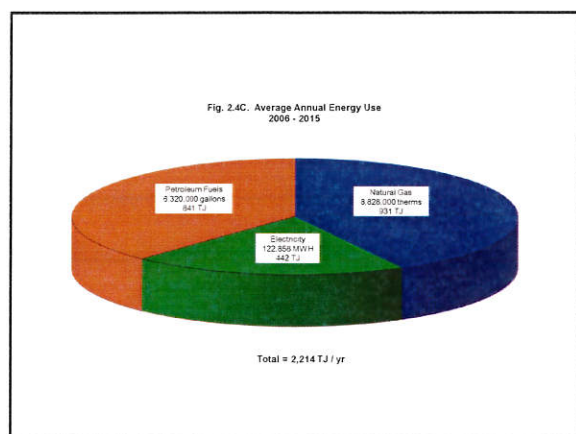
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## All Hydrocarbon Fuels Produce CO<sub>2</sub> when Burned



- Natural gas
  - 50 mt / TJ
  - 17 mt CO<sub>2</sub>e in methane (CH<sub>4</sub>) released
- Electricity
  - Coal: 257 mt / TJ
  - Gas: ~120 mt CO<sub>2</sub> + ~40 mt CO<sub>2</sub>e in CH<sub>4</sub> = 160 mt CO<sub>2</sub>e
  - Hydro, nuclear, solar, wind: zero
- Petroleum
  - 67 mt / TJ

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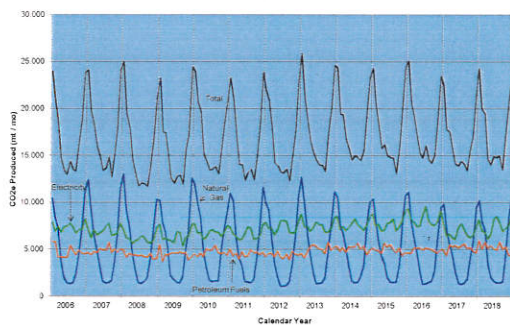
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Fig. 3.4A. MONTHLY GREENHOUSE GAS EMISSIONS




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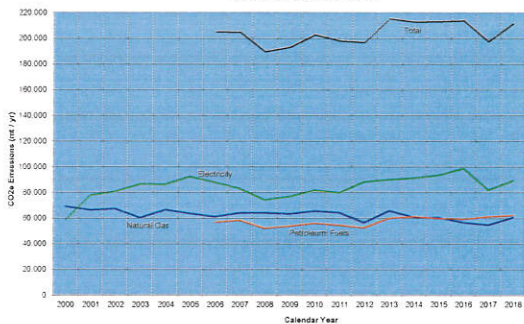
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Fig. 3.4B. ANNUAL GREENHOUSE GAS EMISSIONS  
FROM HYDROCARBON FUELS




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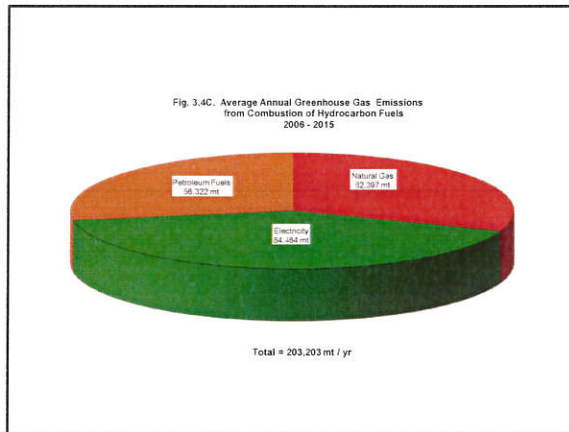
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### Municipal Solid Waste (MSW) Evolves Methane ( $\text{CH}_4$ ) as it Decomposes

- 1 short ton of MSW evolves 62 kg of  $\text{CH}_4$
- $\text{CH}_4$  has a Global Warming Potential 34 times that of  $\text{CO}_2$  over 100 years.
- 1 short ton of MSW evolves 2.1 mt of  $\text{CO}_2\text{e}$

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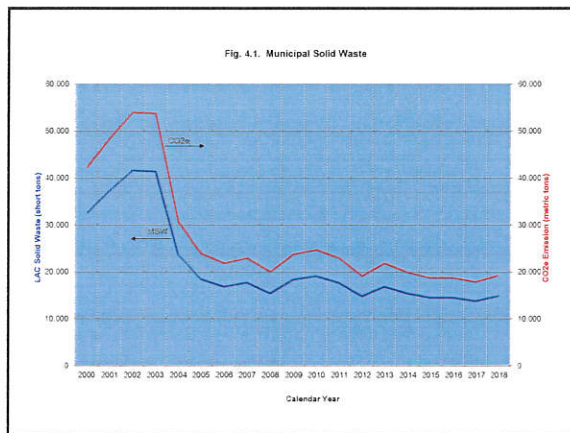
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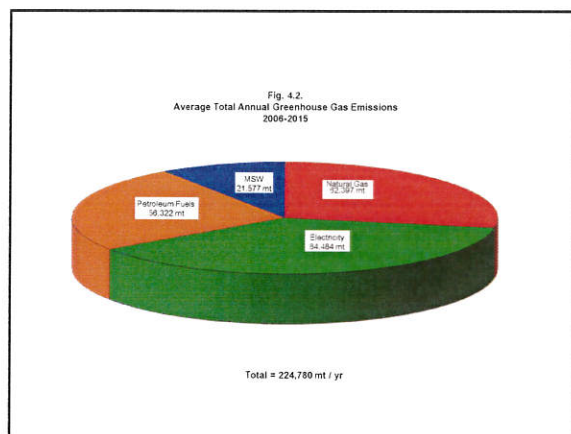
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## Observations

- Overall primary energy use and GHG emissions in LA County have been roughly unchanged since 2000.
- >25% of natural gas not used for space heating
- Electricity
  - ~25% hydro; ~75% CH (mostly coal); <1% solar
  - Supply is pooled with LANL through ECA
  - LAC-owned hydro resources could supply >50% of energy
- Petroleum
  - Use rising slowly
  - “Behavior change” is possible

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## How Can LA Lower its GHG Emissions?

- Public and policy commitment
- Natural gas
  - Move to largely passive solar space heating
  - Reduce non-heating uses
- Electricity
  - More efficient use
  - Shift from coal to nuclear and solar supply (per FER)
- Petroleum
  - Support shift to electric motor vehicles
- MSW
  - Increase recycling

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