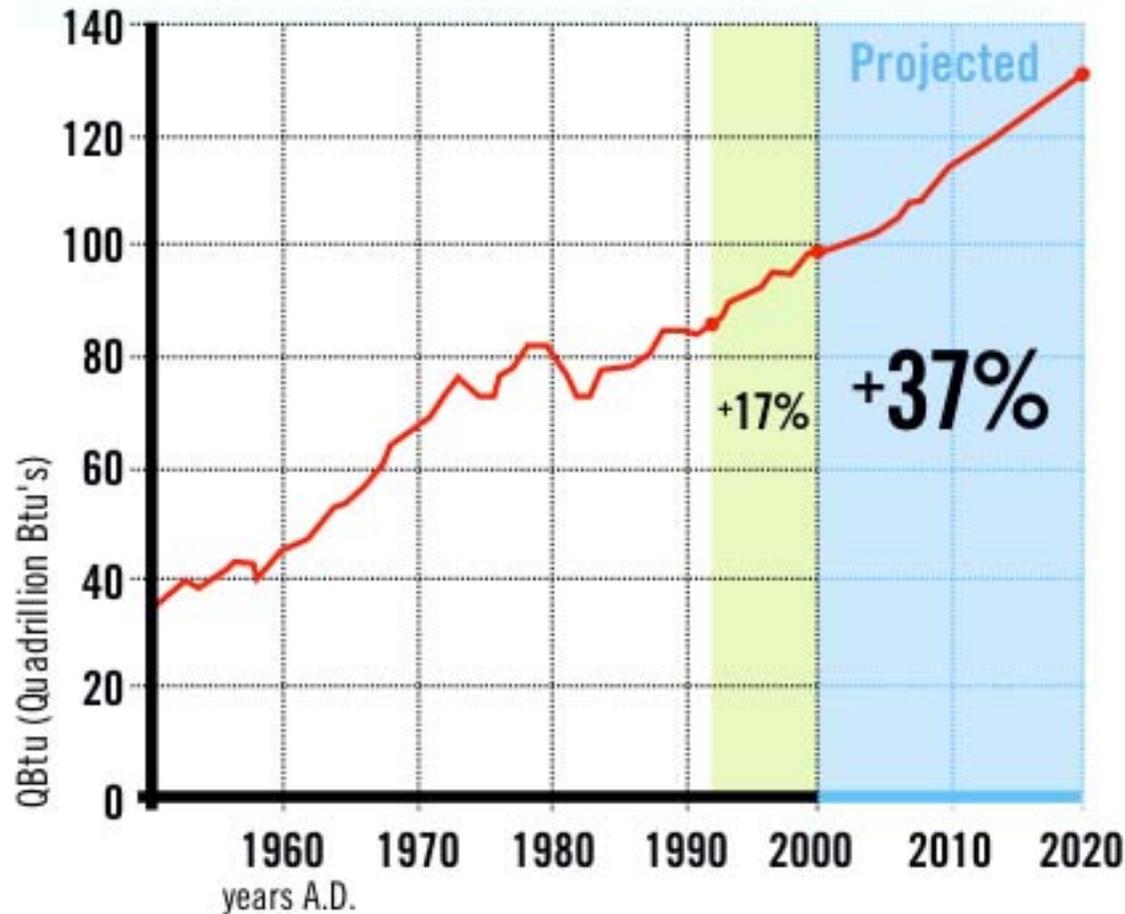


ARCHITECTURE
2030
IN MINNESOTA

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THE SOCIETAL PROBLEM?



United States
Annual Energy Use

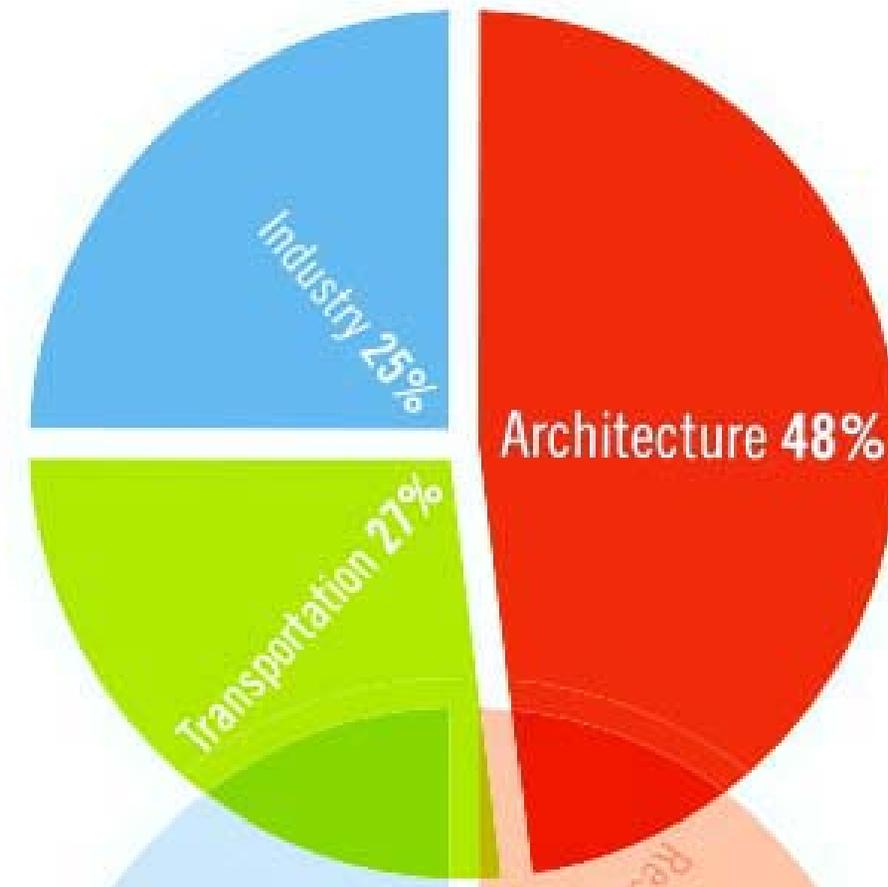
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Source: "Turning Down the Global Thermostat", Metropolis, October 2003

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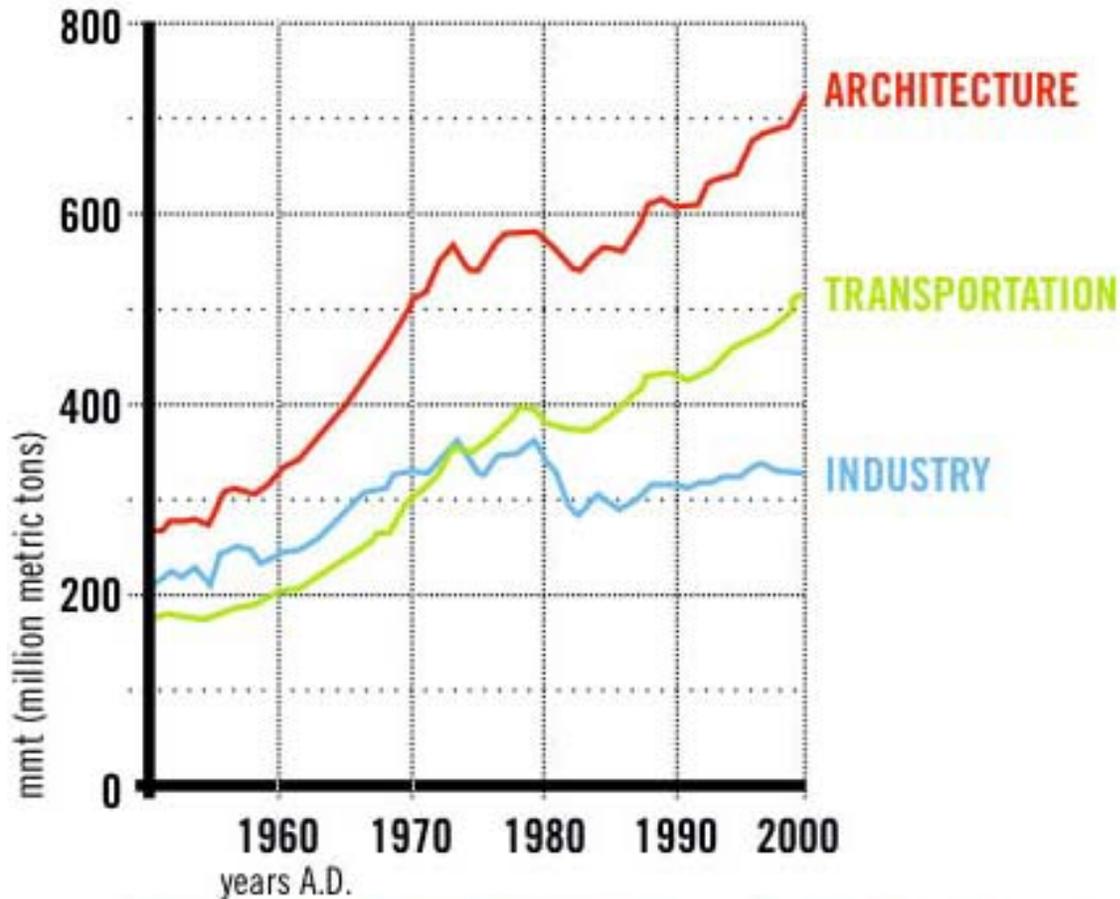
AN ARCHITECTURAL PROBLEM?



United States
Energy Consumption
(by sector)

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ARCHITECTURE 2030 IN MINNESOTA *AN ARCHITECTURAL PROBLEM?*



United States

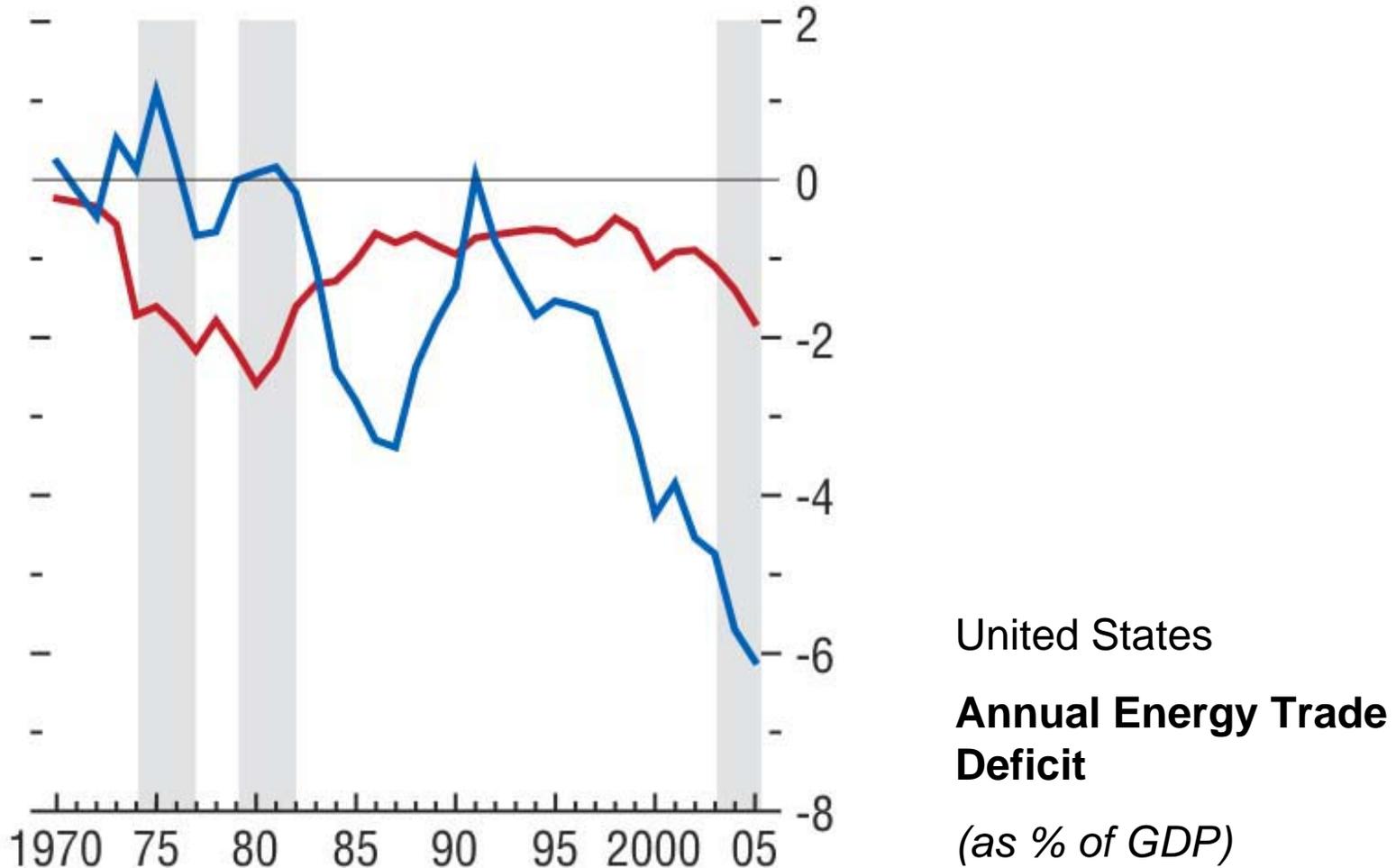
**Carbon Dioxide
Emissions**

(by sector)

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THE \$307 BILLION PROBLEM?



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AN OVERVIEW

Prior to 2007:

- B3: Benchmarks, Building and Beyond
- Sustainable Design Guidelines

2007 Next Generation Energy Act:

- Energy savings requirement
- Energy-efficient building goals
- Global warming goals: Climate Change Advisory Group

2008 “Minnesota 2030” Act:

- Expand Sustainable Design Guidelines to major renovations
- Architecture 2030 targets, up to 90% reduction in 2025

ARCHITECTURE 2030 IN MINNESOTA

PRIOR TO 2007

B3: “Buildings, Benchmarks and Beyond”

(adopted in 2001)

“The department of administration shall

maintain information on energy usage in all public buildings

for the purpose of establishing energy efficiency benchmarks and energy conservation goals...

The department shall develop, in coordination with the department of commerce, a comprehensive plan to maximize energy efficiency in existing public buildings through conservation measures having a simple payback within 10 to 15 years.”

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PRIOR TO 2007

B3: “Buildings, Benchmarks and Beyond”

Mission

1. Gather energy consumption data on every Minnesota public building.
2. Benchmark performance
3. Identify short list of buildings with greatest ROI for conservation improvements.

Scope

State, County, City and Public Schools.

Limited to buildings over 5,000 sq ft (approx. 475 sq m).

Recently identified 5,746 total public buildings of this size.

Last informal estimate of completion: ~90-95%.

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PRIOR TO 2007

Sustainable Design Guidelines

(took effect in 2004 on all state-bonded projects)

GOALS:

- Reduce energy consumption by 30%
- Lowest possible life-cycle costs
- Improve indoor air quality
- Improve productivity
- Reduce material costs
- Compatibility with LEED guidelines

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2007: “The Year of Energy”:

Renewable Energy Standard

Stronger Conservation and Efficiency mandate

Global Warming Mitigation goals

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2007 LEGISLATION

Renewable Electricity Standard

(Strongest RES in the United States)

For Xcel Energy (only nuclear utility; approx. 1/2 of state's power):

30% renewables by 2020

For all other utilities:

25% renewables by 2025

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2007 LEGISLATION

Renewable Electricity Standard

Qualifying Renewables:

1. Solar
2. Wind
3. Hydropower smaller than 100 MW
4. Hydrogen, generated by renewable power
5. Biomass

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2007 NEXT GENERATION ENERGY ACT

Energy Savings Goals

(Strongest energy efficiency performance standard in the United States)

It is the energy policy of the state of Minnesota to **achieve annual energy savings equal to 1.5 percent** of annual retail energy sales of electricity and natural gas...

directly through energy conservation improvement programs...

and **indirectly** through energy codes and appliance standards, etc...

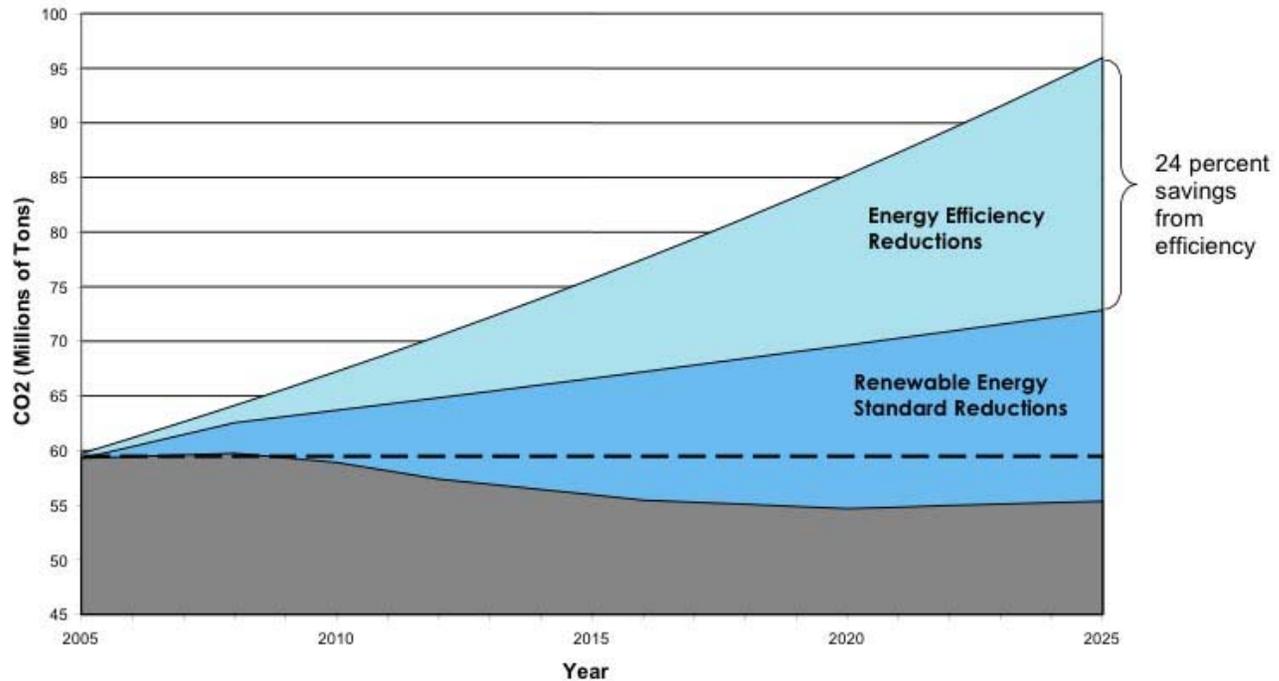
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ARCHITECTURE 2030 IN MINNESOTA *2007 NEXT GENERATION ENERGY ACT*

Energy Savings Goals

1.5 Percent Annual Reduction in Consumption



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2007 NEXT GENERATION ENERGY ACT

Energy Savings Goals

“1.5% annual reduction...

[with at least 1.0%] directly through the

Conservation Improvement Program [CIP]”

Utility-centered program, with oversight by Department of Commerce.

Pre-2007, CIP mandate was a spending requirement.

Post-2007, CIP mandate is now an energy savings mandate, of at least 1.0% each year for each utility. Every utility is now covered under the mandate.

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2007 NEXT GENERATION ENERGY ACT

Energy Savings Goals:

**“1.5% annual reduction... directly through [CIP]...
and indirectly through:**

- Energy Codes
- Appliance Standards
- Consumer Behavior-change marketing programs
- System-Wide infrastructure efficiency improvements,
- Other Efforts

ARCHITECTURE 2030 IN MINNESOTA

2007 NEXT GENERATION ENERGY ACT

Facilities Energy Efficiency

Revise Sustainable Design Guidelines

Update B3 tool

“Green Building” goals by Dec. 31, 2010:

- 1,000 Energy Star-labeled commercial buildings
- 100 LEED- or Green Globes-certified commercial buildings

ARCHITECTURE 2030 IN MINNESOTA

2007 NEXT GENERATION ENERGY ACT

Global Warming Goals

From 2005 benchmarked goals:

- 15% by 2015
- 30% by 2025
- 80% by 2050

Climate Change Action Plan to the legislature by Feb 2008.

Comprehensive Global Warming Plan must be enacted by August 2009.

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Governor's Minnesota Climate Change Advisory Group

RESIDENTIAL - COMMERCIAL - INDUSTRIAL GROUP:

**Unanimous Support for “Green Building Guidelines
and Standards based on *Architecture 2030*”**

ESTIMATED SAVINGS:

11.1 MMt of CO2 equivalent

\$296 million

\$ 27 million / 1 MMt of CO2 savings

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ARCHITECTURE 2030 IN MINNESOTA *2008*

Minnesota 2030 Act

Chief Authors: Sen. Yvonne Prettner Solon and Rep. Bill Hilty

IMPACT:

New and “substantially reconstructed” commercial, industrial and institutional buildings.

TARGET:

60% reduction by 2010; 80% by 2020;

70% by 2015; 90% by 2025.

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ARCHITECTURE 2030 IN MINNESOTA *2008*

Minnesota 2030 Act

\$500,000 annual assessment, paid for by utilities

Contracted to University of Minnesota's Center for Sustainable Building Research to develop a plan to:

- 1. Train architects;**
- 2. Incorporate 2030 standards into utility conservation programs**
- 3. Developing monitoring procedures for 2030 buildings**

Plan due to House and Senate by July 1, 2009

ARCHITECTURE 2030 IN MINNESOTA *2008*

Minnesota 2030 Act

ONGOING WORK:

- 1. R&D of new technologies and techniques**
- 2. Analysis of design practices and energy modeling**
- 3. Cost-effectiveness analysis**
- 4. Training programs for designers, builders, etc...**
- 5. Analysis of operations on energy use**

**Require utilities to incorporate 2030 practices in their
CIP plans and programs**

ARCHITECTURE 2030 IN MINNESOTA

Contact me:

State Representative Jeremy Kalin, district 17B - Chisago County

579 State Office Building

100 Dr. Rev. Martin Luther King Jr. Dr.

St. Paul MN 55155

Rep.Jeremy.Kalin@House.mn

651-296-5377 (office)

www.House.mn/17b

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