

# Affordable Housing

## *Impact of Technical Innovations*

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# Affordable Housing?



# Affordable Housing?



\$475,000



\$475,000



# Affordability is Complicated

( just a few issues)

- Regulatory Policy Issues
- Household Composition & Needs
- Overall Monthly Household Budget
- Rental vs Ownership
- “Best-fit” Housing Programs
  - Subsidies
  - Mortgage credit structure
  - Assisted building programs

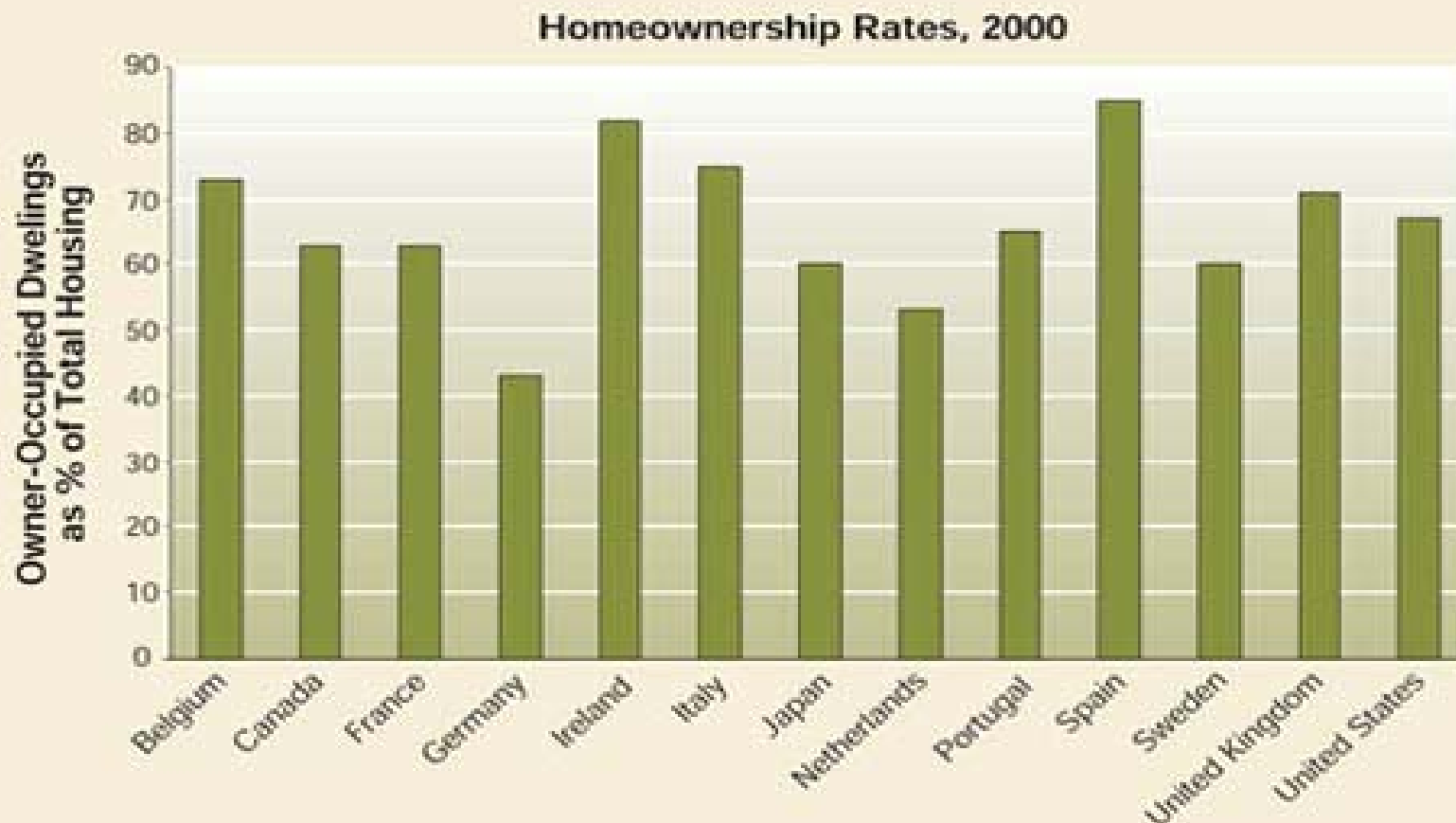
# Sensible Goals

- Preserve & expand supply of good housing
- Improve affordability for working class
- Link housing with community & workplace
- Create flexible regulatory policy
- Promote neighborhood diversity
- Lower monthly housing expenditures

US ownership 47.8% in 1950 → 67.9% in 2002

## U.S. vs. World

The United States is in the middle of the pack when it comes to encouraging homeownership, while the size of its homes far outpaces other nations.



NOTE: 1998 figure was used for % of owner-occupied dwellings in Japan

SOURCE: Eurostat, Statistics Canada, U.S. Census Bureau, Statistics Bureau (Japan)

# Narrow, But Important Question

*Can we significantly lower housing costs through the advancement of technology used in the building process?*

# Presidential & Congressional Directive - 1998

Department of Housing and Urban  
Development (HUD)

*Develop technologies, housing components, designs, and production methods that will move into the marketplace more quickly & lower the cost of housing in our country.*

# Partnership for Advancing Technology in Housing (PATH)

- NAS/NRC Assessment of HUD 2000 - 2003
- Technology-based housing initiative
  - ✓ More affordable to own & maintain
  - ✓ More energy efficient
  - ✓ More environmentally sustainable
  - ✓ More durable
  - ✓ Safer

# Specific PATH Goals

1. Reduce monthly cost of new housing 20%
2. Cut environmental impact & energy of new homes 50%
3. Reduce energy use in 15M existing homes 30%
4. Improve durability & cut maintenance costs 50%
5. Reduce injuries to residential construction workers 20%

# *Reality Check*

**Are Goals Attainable?**

**NRC Panel's Findings...**

# Goal #1 -- Reduce monthly cost of new housing 20%

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*Exclusive of financing & land prices!*

- Goal is not attainable using technology
- Operations, materials, labor & energy <50% of housing cost
- Cost of controllable factors would have to be reduced by 50% to achieve this goal.

# Goals #2 and #3

## Cut Environmental Impact & Energy

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*Difficult to assess because no benchmarks exist*

Goals mix related but not congruent issues

- Technology used to lower energy may impact IAQ
- Tangle of issues like recycling, water use, materials, & construction waste
- Strategies to reduce energy vary widely for existing and new homes

# Goal #4 -- Improve durability & cut maintenance costs 50%

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- Improved durability achievable
- Can reduce maintenance costs
- Can reduce life-cycle costs
- Usually increase first cost
  - At odds with reducing monthly costs 20%
  - Amortizing first costs major cost factor

# Goal #5 -- Reduce injuries to residential construction workers 20%

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- Possible to achieve
- This will lower housing costs
- Lack baseline data

# Findings

- **Goals are unrealistic - Note: mfg. housing 40% less!**
- **Technology can significantly lower costs**
- **Assimilation of technological innovation is slow**
- **Technological benefits not widely publicized & are not fundamental drivers for consumers**
- **Need coordinated focus of public & private sectors**
- **Vital educational & informational connection needed between government - researchers - manufacturers - builders - consumers.**

# Recommendations to the President, Congress & HUD

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**Government should facilitate technology  
development and adoption**

# Specifically

1. Improve technology transfer, development & adoption through information dissemination
2. Advance research on housing technologies & foster development of new technology
3. Focus administrative energy on barrier removal
4. Encourage development & diffusion of accurate unbiased information about new technologies
5. Expand demonstration & evaluation projects
6. Create database detailing relative advantages and compatibilities

# PATH Website

<http://www.pathnet.org/>

- ToolBase useful inventory of available technology <http://www.toolbase.org/>
- Technology inventory <http://www.toolbase.org/techinv/index.aspx>