

Micro-CHP is here: How to make it fit in PA



 Climate Energy **freewatt**

POWERED by **HONDA**™

Over the last 10 years the US space heating
appliance industry produced about 1,000,000
Megawatts of Thermal Capacity



Total USA Installed Electric
Capacity ~ 800,000 Megawatts



Electric Power from your heating system

- Small-Scale Cogeneration
- Combined Heat and Power
- Micro-CHP (1 to 5 kW)

Fuel → Heat + Electricity

Micro-CHP Needs to be:

Affordable



Practical



The right
capacity



Low emissions



Grid connection

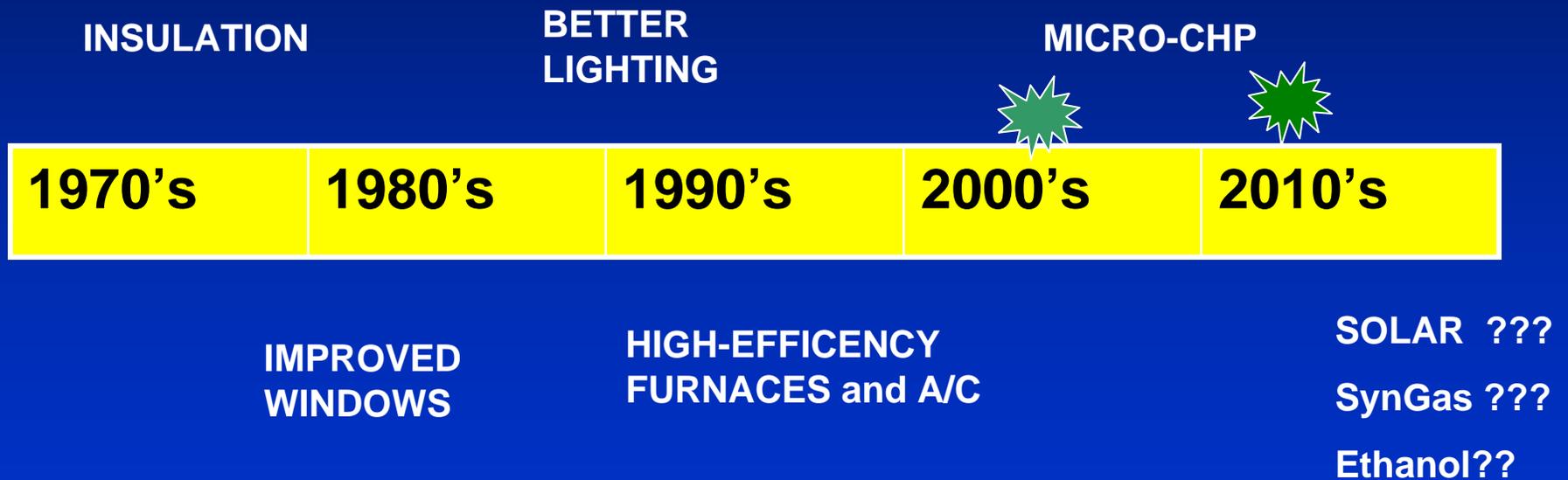


Quiet



Micro-CHP

Next Big Thing in Residential Energy



Continuing Niche Players: Wood, Solid Biomass, Geothermal

**Popular
Mechanics**

**2006
Breakthrough
Product Award**

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Climate Energy Micro-CHP

Grid-connected, professionally-installed space and water heating appliances that

1) generate significant electric power as a byproduct of normal operation

Definition

+

2) provide self-powering, emergency backup power, and grid support capability

Residential and Commercial

Honda IC Engine Technology

The Best Fit Today Because ...



Size: 1.2 kWe, 12,000 Btu/hr

Total Efficiency: Over 85%

Emissions: Low NOx, CO

Quiet Operation: < 46 dBA

Cost: Most competitive

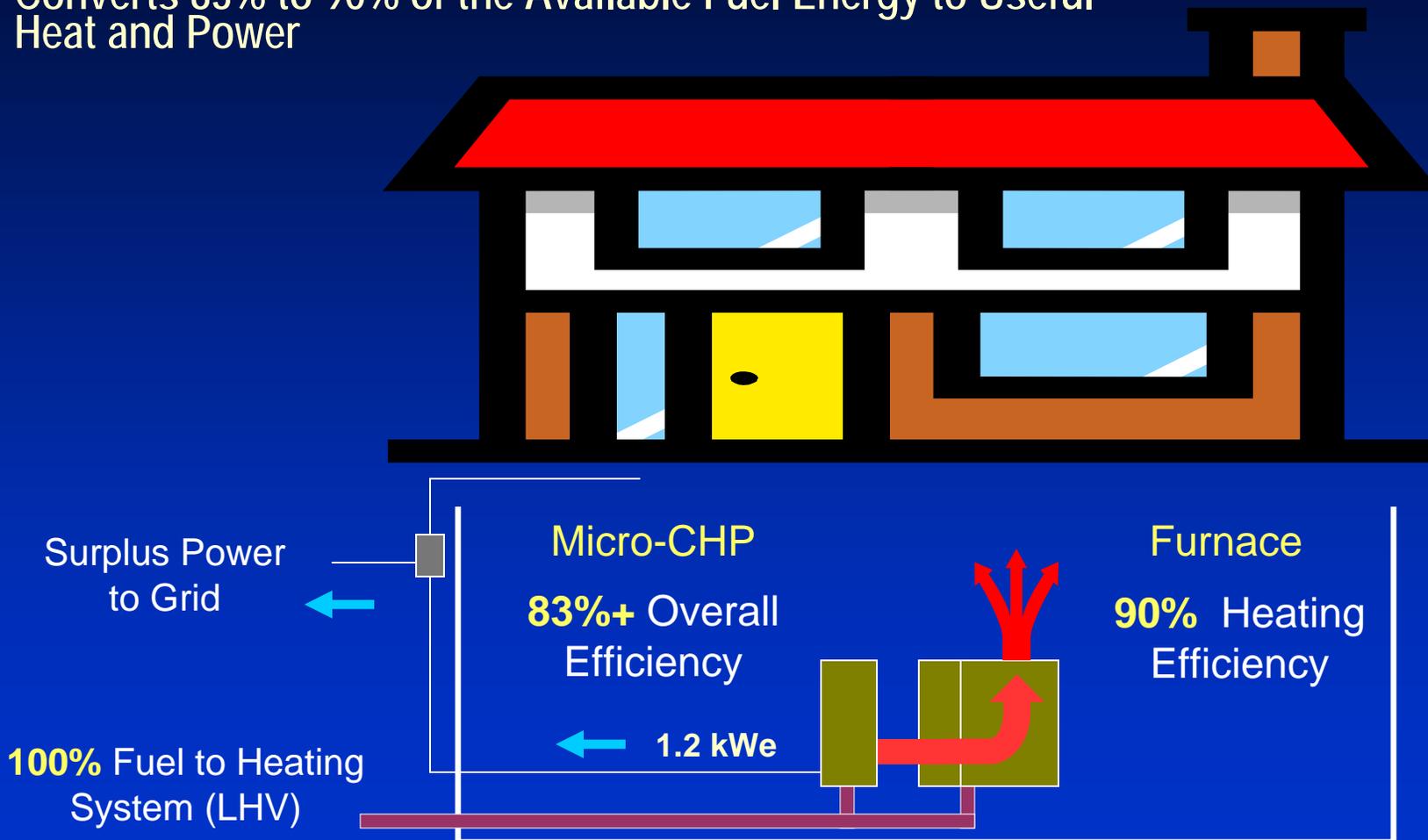
Quality: It's a Honda

**History: 30,000 Sold to Date
in Japan**

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Converts 83% to 90% of the Available Fuel Energy to Useful Heat and Power





On-line 24-7



Service Provider



Climate Energy Office



**Owner @ Home, Work,
& Vacation**



Micro-CHP Potential Benefits to the Homeowner

- **Significantly reduced electric bills, about 50%**
- **Reduced Gas Rate?**
- **Backup power supply in event of grid outage**
- **Reduced impact on the environment with no lifestyle change**

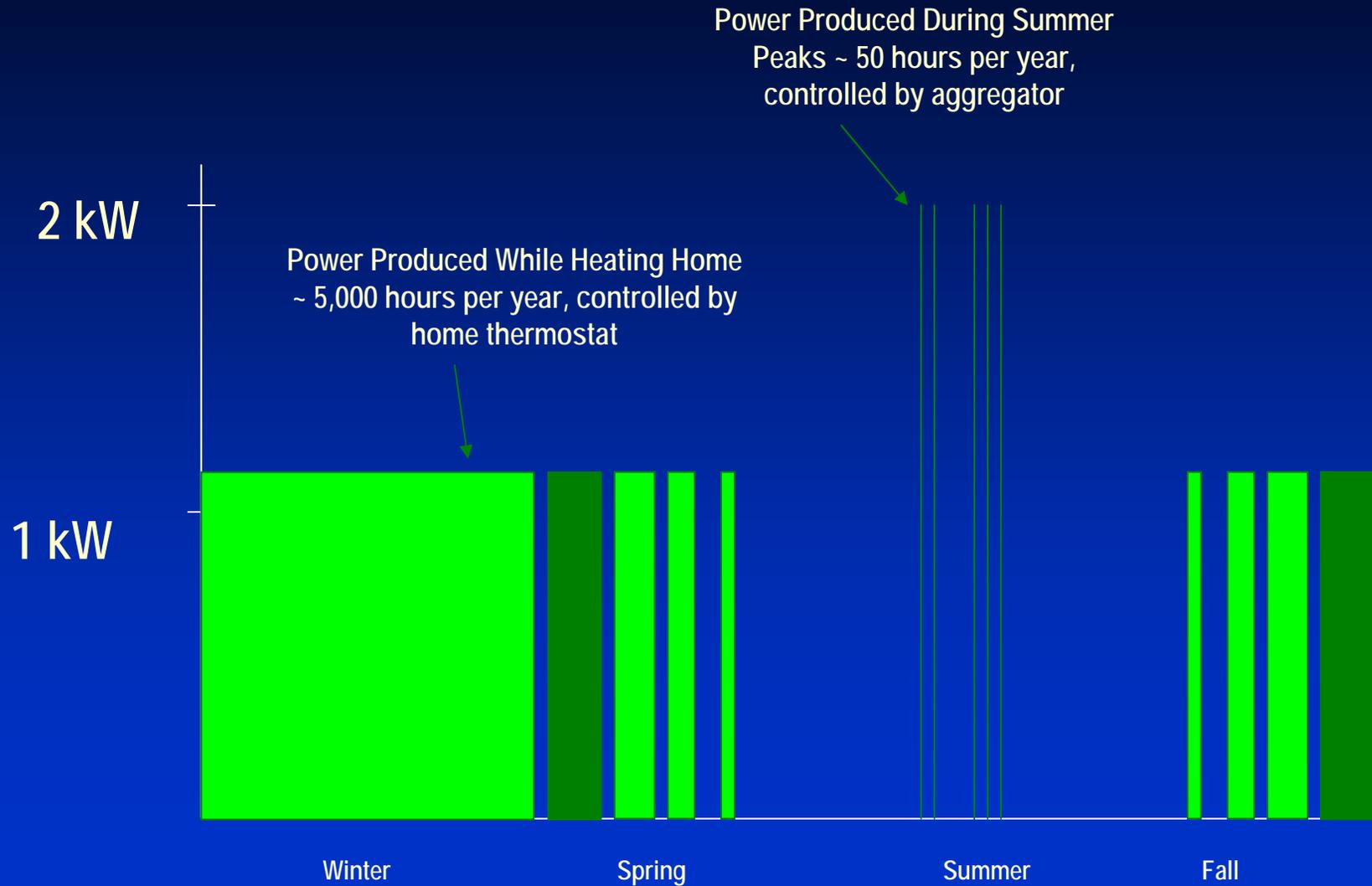


Micro-CHP Benefits to the Pennsylvania Electric Utility System

- **Reduced Need for Generation and Distribution of Power**
- **New low-cost peak demand management resource**



Power Generation Profile Grid-Connected Home with Micro-CHP



Micro-CHP Implementation Plan for Pennsylvania

- **Phase 1: Pilot-Transition Program ~ 1,000 homes**

Total installed Capacity 1 to 2 Megawatts

2 years duration

Temporary Rules

- **Phase 2: Fully Developed Long-Term Program**

Size and Limits to be determined as appropriate -
Suggested Goal (20% of annual gas air furnace and boiler sales
be promoted for Micro-CHP, i.e. approximately 30,000 based
upon 2005 sales in PA.

Long-term Rules

Micro-CHP Pilot Program: Temporary Rules

- Must be simple and recognize sensitive economics on both owner and utility sides
- Must be practical for heating installation contractor, home owner, gas utility and electric utility
- Recognize that micro-CHP has potential major long-term role in meeting PA energy needs, but needs and warrants some nurturing to get started
- Anticipate full equity to all parties is possible in long-term rules developed from pilot experience.

Micro-CHP Pilot Program: Temporary Rules Recommendation

- Distributed Generation Gas discount
- Single Gas Meter with Class-of-Application Correction Factor
- True Net Electric Metering applies with Single Bi-Directional Electric Meter
- Grid Interconnection by simplified rules and procedures
- Aggregation and Control for Summer Peak Grid Support not required

What's Next for Climate Energy in Pennsylvania?

- Warm Air Micro-CHP Retail Sales – Beginning Second Quarter of 2007
- Hydronic Micro-CHP System – Beginning Fourth Quarter of 2007

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