



# THE GLASS ART SOCIETY

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**Panel: Fueling the Habit—  
What Does the Future Hold?**

*David Levi, moderator*

**SUMMARY**

**T**he scope of this panel was first conceived as a comparison of the relative advantages and disadvantages of glass melting with electric versus gas-fired furnaces. Following recent surges and unpredictability in fuel costs, and the stark realization among many glass studio operators and users that a significant portion of operating costs go to pay the energy bill, it was decided to expand the conversation to potential solutions to the problem of efficient and low-cost energy use.

The following is a brief and general summary of the conversation, beginning with the comments of Doug Auer and Steve Stadelman and continuing into a lively discussion with much audience participation.

For cost analysis, accurate metering is the place to begin. Not only do electricity costs vary regionally and even micro-regionally, it can often be difficult to get good figures from utility companies. Find out about “demand charges” which can appear on your bill. They may be used to capitalize the utility company’s infrastructure improvements, for example, or may kick in when certain demand ceilings are reached. Try Googling “electrical tariffs.” Natural gas and propane prices fluctuate seasonally and are unpredictable. Steve asked, “Has everyone figured it out?” The answer is that there are no hard answers. In the end, you just have to commit. It may be increasingly practical to locate your studio in regions where energy costs are low.



David Levi

Furnace recuperators are a good focus for possible savings. Efficiency improves dramatically with the ability to preheat combustion air to higher temperatures. Generally, as the temperature increases, so does the need for “fiddling and maintenance.”

Glory holes may be the next candidates for recuperators. As a proportion of the total bill, the pipe-warmer uses more gas than you think.

Variable-speed, individual blowers on glory hole burners promise some cost savings.

Sometimes tossing another layer of fiber insulation on a piece of equipment can provide the biggest bang for the buck. Beyond a certain point (in the neighborhood of ten or twelve-inches-thick), insulation actually begins to behave like a radiator and places increased demand on the system.

Other technologies were addressed: compressed air / ethanol burners, bio-mass and oil drip burners, hydrogen cell operating systems, gas / oxy or oxygen impingement systems, microwave technology (interesting at a small capacity—100 to 300 pounds—but still 10 to 15 years out), and wind electric generation. There appear to be a multitude of possibilities under consideration at the theoretical level.

**THIRD DEGREE GLASS FACTORY  
FURNACE COMPARISON DATA**

**Energy Use Summary**

**Gas Furnace**

IDLE  
.7238 Therms/Hr  
72,000 BTU/Hr  
\$1.21/Therm=\$.87/hr

CHARGE  
1.86 Therms/Hr  
186,000 BTU/Hr  
\$1.21/Therm=\$2.25/hr

**INITIAL COSTS OF COMBUSTION SYSTEM**

Total                      ???  
1000-4000

**Electric Furnace**

IDLE  
8.3 KW/hr  
28,225 BTU/hr  
\$0.068/KWhr=\$0.56/hr

CHARGE  
22.2 KW/hr  
75,750 BTU/hr  
\$0.068/KWhr=\$1.51/hr

**INITIAL COST OF ELECTRICAL SYSTEM**

Transformer                      1500  
Scr                                      2000  
Elements                              1000  
Misc. Controls                      1500  
Total                                      6000

**Local Energy Cost Comparison**

	Charge BTU/hr	Charging Cost/hr	Idle BTU/hr	Idle Cost/hr
GAS	186K	\$2.25	72K	\$0.87
Electric	76K	\$1.51	28K	\$0.56

**Energy Required**

	Charging/ hour	Daily User/hr	Local Cost/unit	Charging Cost/hr	Daily Use/hr
KW	22.2000	8.30	0.068	1.5096	0.5644
Therms	1.8612	0.72	1.208	2.2480	0.8744

To summarize the data, the gas furnace uses approximately three times the BTUs to do the same job as the electric.



Douglas Auer

DOUGLAS AUER RECEIVED HIS BFA FROM SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE AND HAS BEEN BLOWING GLASS SINCE 1996. HE WAS THE GLASS INSTRUCTOR AT WASHINGTON UNIVERSITY, ST. LOUIS, FROM 2001 - 2004. IN 2001, DOUG TEAMED WITH JIM MCKELVEY TO BUILD THE THIRD DEGREE GLASS FACTORY AND ITS EQUIPMENT.