

Game Arcade: Turn Up the Heat!

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Game play video: <http://bit.ly/1eUYIX1>

As a global society we face unprecedented challenges related to environmental sustainability. **Turn Up the Heat!** is a collaborative board game that provides families with a playful context for discussing household heating and cooling systems and tradeoffs related to energy, comfort, and money. Through a tablet computer interface, the game offers all players (children and adults) the opportunity to set a thermostat on their turns. By allowing families to see the immediate effects of temperature settings with both a manual and programmable thermostat interface (Figure 2), we confront usability issues and misconceptions around residential thermostat use. We also examine the role of board games as a *cultural form* through which to foster whole-family interaction and learning around sophisticated and potentially difficult concepts related to energy consumption.



Figure 1: Turn Up the Heat is a cooperative board game in which players make tradeoffs related to comfort, energy, money, and environmental sustainability.

The game is designed for 2-5 players ages eight and up, and it features a cooperative style of play, meaning that players must work together instead of against each other to beat the game. Turn Up the Heat! consists of both traditional and digital components, where players use a board, dice, cards, tokens in addition to a tablet computer app (Figure 1). The app acts as the central interface of play, enabling each player to simulate heating and cooling systems based on their temperature preferences, outdoor temperatures, thermostat settings, and home insulation levels (Figure 3).

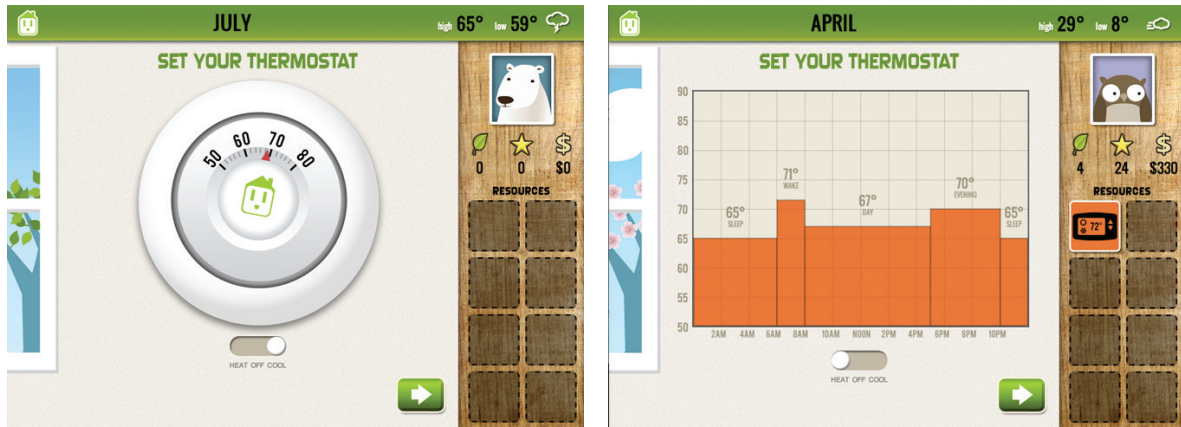


Figure 2: Players start the game with a manual thermostat (left) that can only set one temperature value per turn. Families can upgrade to an Internet thermostat (right) that allows players to set temperatures for four different time zones.

To win the game, players must survive for one full year without debt and earn at least 20 *Green Points* and 20 *Comfort Points*. After setting the thermostat, players have the option of using one of their *Resource Cards* to make it easier to earn points. Some resources (such as warm clothes, hot chocolate, and lemonade) can be used to expand an individual player's comfort zone, making it easier to earn *Comfort Points* while using less energy. Other resources (such as insulation, storm windows, and a programmable thermostat) cost money but make the game easier for all players through improving the home's infrastructure. At times, players may land on the spaces of special events on the board (such as power outage, broken window), where they are required to draw one of the *Event Cards*. *Event Cards* usually make the game more challenging, but they are not always negative.

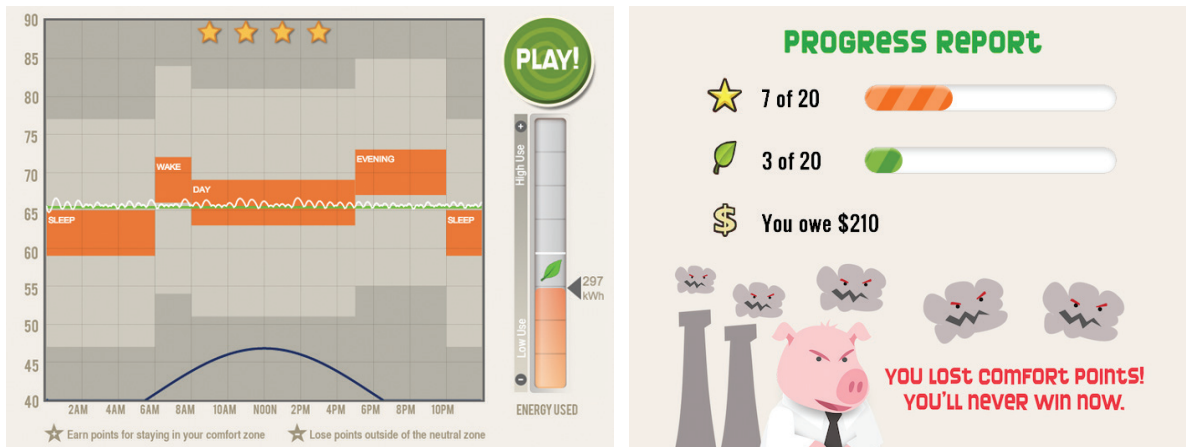


Figure 3: The simulation screen (left) shows each player the results on how their thermostat settings affect their comfort, bill and the environment. Following the simulation screen, each player gets a progress report (right) that summarizes the points they earn and the amount of the energy bill per turn.

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