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# Invasion of the Energy Monsters

A Spooky Game About Saving Energy

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Abstract

We present a cooperative tabletop game called Invasion of the Energy Monsters designed to help families reflect on how they use energy at home and to think about implications for global environmental sustainability. The premise of the game is that your home is being invaded by a menagerie of menacing energy monsters, each representing a different form of waste. The monsters start out weak but quickly grow stronger as they feast on your excess electricity usage. The energy heroes must band together and expel the monsters before it's too late.

Design and Game Play

Invasion of the Energy Monsters is a cooperative tabletop game for 2-4 players ages 6 and up. In the game, energy monsters (Figure 1), each representing a different form of waste, attack your home. Bonehead is a mindless energy zombie who's always forgetting to turn off lights and appliances. Wattwolf loves poor insulation and old, inefficient appliances. Ampire has a knack for doing things inefficiently, like running a half-empty dishwasher on heated-dry mode. You and your family play the role of energy heroes.
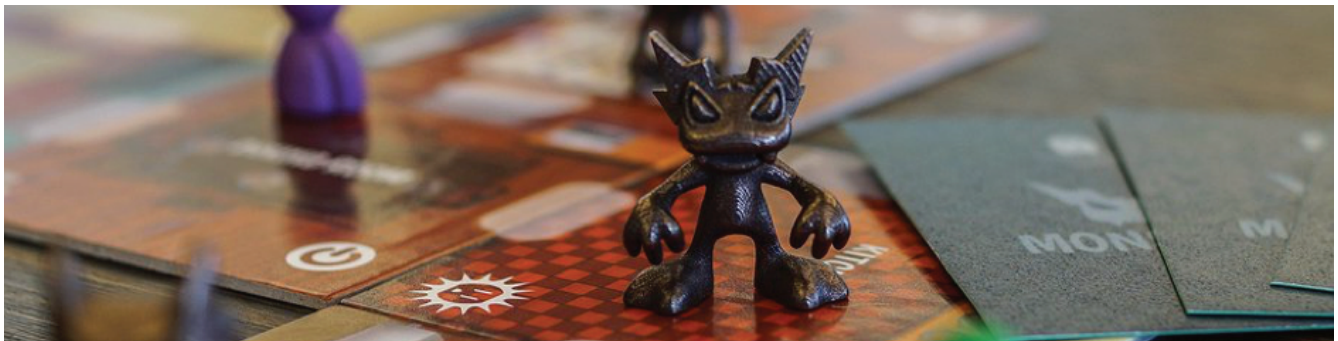
To win the game, the energy heroes must band together and expel the energy monsters from their home before it's too late. On each turn, the monsters find a devious new way to waste energy. As the energy level rises, your electricity bill gets more expensive and the monsters become stronger. If the monsters ever get the power level above 3,000 watts or the heroes run out of money, the game is lost. The heroes work together to turn off appliances and electronics while avoiding the monsters. At the beginning of

the game, players create a house from a collection of 21 room tiles. Each tile has an OFF side and an ON side that indicates the power used by an appliance or device in that room (see Figure 3b and 3c). For example, the Basement has a spare refrigerator that uses 200 watts when plugged in. Each tile also indicates the type of switch needed to turn the appliance off (sockets, remote controls, light switches, power buttons, and thermostats). On each turn a player moves his or her hero token, plays hero cards, and trade cards with other players in the same room. At the end of their turn, players must flip over one purple monster card indicating a new form of energy waste. For example, flipping over the basement card means that Wattwolf plugs in the old spare fridge in the basement. To turn a device or appliance off, players must move to that room and play two corresponding switch cards.

Figure 1. Energy Monster miniatures (Bonehead, Wattwolf, and Ampire).

Figure 2. a) Close-up of the power spinner. The orange area is variable & conveys current energy usage based on game state (b) Power spinner on an iPad app (on the whole-home extension of Energy Monsters) that also takes input from household infrastructure to affect game state. (c) Energy consumption data shown on the app.

Heroes can also attack monsters by playing an attack card against monsters in the same room and then spinning a power spinner (Figure 2a) with a probability that changes with the energy consumption level (visible in Figure 3a from an actual gameplay session). If the spinner lands in the black region, the heroes win the attack and the monster is temporarily removed from the game. Heroes win the game by expelling all four monsters before they run out of money.

Smart Home Extension

We have an expansion of this game currently under development that makes use of a tablet computer

app connected to a whole-home electricity meter. Since whole-home electricity meters are not yet commonplace, we are playtesting the concept by deploying Apple Homekit enabled sockets in homes.

These wireless electricity meters transmit energy consumption data to the companion iPad app (Figure 2c) and affect game state. In this version, players will start the game with an *Energy Blitz* in which they run around their house turning on as many lights and appliances as they can. This will immediately be reflected on a digital power meter. As the game progresses, heroes will be able to play special cards allowing them to turn off real appliances and devices in their house, thus weakening the monsters.
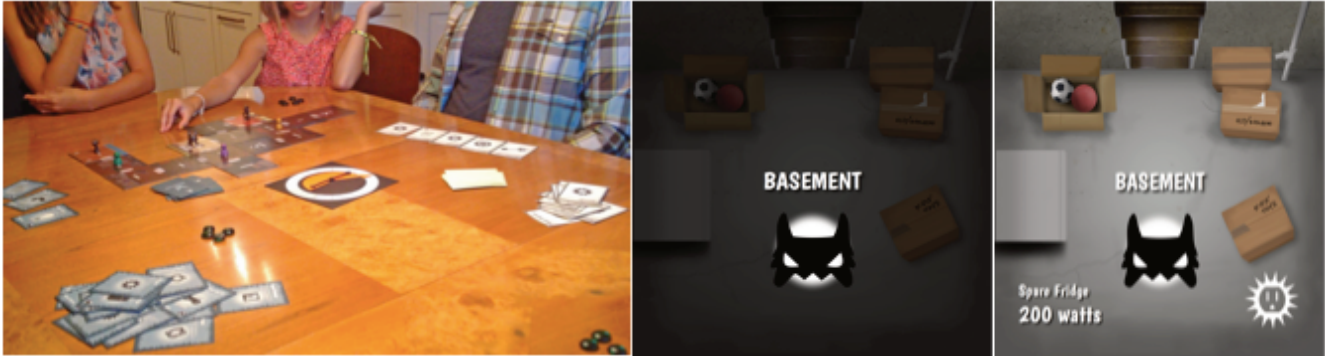

Figure 3. a) A family playing the game. b) Example room tile showing an appliance and c) the rate of energy consumption of the appliance and the switch card needed to turn it off.

Credits

Monster & Title Artwork: Eric Uchalik (euchalik.com).

Room Artwork: Maisa Morin (maisamorin.com).

Research, Design Advice, and Playtesting: David Horn, Hannah Horn, Madeleine Reed-Horn, Gabby Anton, Sarah D'Angelo, Pei-Yi Kuo, Cameron MacArthur, Zhao Ziong.