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Power R Future

Resource-Based Energy
Simulation and Modeling
Game

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Brief Overview of the Proposed Game

- A global energy simulation game
 - Models world energy supply and demand
 - Supports multiple modes of play from “what-if” educational modeling system to fully interactive single-player game
 - Core game would target maximizing results by a target date, such as 2060
 - Modeling is driven by energy scenario files
 - Open-format files allow user updating and customization of model parameters
- Interactive play style similar to *SimCity*®

What the Simulation Models

- Supply, demand and cost of energy
- Impact of energy availability on economy, environment, standard of living, geopolitics, technological advances, etc.
 - Impact of different forms of energy generation on above factors
 - Feedback of all above factors on demand for energy
- Many additional resources, consequences and variables are modeled
- All factors are modeled both regionally and globally
- The complexity of the modeling is adjustable
 - It's important to keep model complexity balanced with the player's capacity to understand cause and effect

Energy Model Elements

- Models all forms of energy generation
- These are just a few of the modeled elements:
 - Research and development time, cost, goals
 - Plant construction cost, materials, time, land, environmental impact
 - Maintenance cost, materials, decommission
 - Operation cost, resources (fuel), energy variance, environmental impact, failures, waste
 - Resource extraction (fuel and materials) cost, time, land, transportation, environmental impact, supply
 - Impacts of energy supply, demand, price, generation, transmission, and environmental impacts on geopolitics, economy, humanitarian issues, etc.

Energy Modeling Goals

- The game models global energy in order to illustrate the real-world issues and practicality of various forms of energy generation at global scale
- While the game aims to draw attention to the benefits of fusion energy, it does not force this conclusion on players
 - Knowledge is more impactful when discovered through play and experimentation
 - Unlike climate models, the model parameters are exposed and allow for multiple energy scenarios
- Avoids bias by allowing third-party scenarios
 - **Bonus:** user-generated content extends life of a game

Refocusing the Energy Debate

- Computer games have become one of the most effect mediums for advancing social issues
 - http://www.theesa.com/wp-content/uploads/2014/11/Games_Improving_Social-Issues-11.4.pdf
- The goal is that by making this game an open system in terms of the model parameters, that the different interest groups will extend the model elements and parameters to illustrate their arguments
 - Moves the debate from wild promises to modeled numbers and facts
 - Puts pressure on proponents of policies and technologies to demonstrate how they stack up against alternatives
- Energy scenarios are constantly updated with latest real-world facts and forms of energy generation, so models are never out of date

Interactive Play

- Interactive play involves making moment-to-moment decisions as the simulation advances
 - Where to build power plants, and what type
 - Building transmission lines
 - Energy policy decisions
 - Regulations
 - Research and development
 - Energy efficiency and use
 - Environment & land use
 - Resource extraction
 - Responding to new developments, natural disasters, political upheaval and other events
 - Many others
- Players will be able to automate any decisions or disable features to simplify what they need to manage

Modes of Play

- Each of the player-controlled elements can be automated
 - Player-controlled elements are modeled by policies in the scenario that the user can modify
 - Allows scaling both model complexity and difficulty level of play
- Simulations can be run in full-auto mode to ask “what if” questions without playing the game
 - Full-auto mode supports Monte Carlo modeling by repeatedly running simulation with the same parameters and aggregating results

Target Markets

- Platforms
 - Windows
 - Mac
- Countries
 - Primary
 - USA, Israel, Canada, Europe, Japan
 - Secondary
 - China, Russia, India, Brazil, Australia/New Zealand
- Languages
 - Primary
 - English, Spanish, French, German, Japanese
 - Secondary
 - Hebrew, Mandarin Chinese, Russian, Portuguese

Target Audiences

- Roughly in order of priority, the primary target audiences for the game are
 - Game players
 - Energy advocates
 - Environmentalists
 - Humanitarians
 - Educational
 - Futurists
 - Nationalists
- There is plenty of overlap between these groups

Game Player Audience

- Must have engaging and balanced game play
- Players spend 100s of hours building their creations
- Simulation games are one of the eight major video game genres ([Wikipedia](#))
 - [Construction and management simulation games](#) have a strong history, with simulations from cities, amusement parks, railroads, and airports to zoos
 - Examples: *SimCity*, *Railroad Tycoon*, *Minecraft*
 - Appeal to broad-spectrum demographics
 - There has never been a mainstream energy simulation game

Energy Advocate Audience

- Energy is a popular topic
 - Hundreds of news items every week on energy-related topics
 - Alternative energy is a popular topic
 - Renewable and self-sustaining energy sources receive high favorability scores
 - Favorable view of nuclear energy increasing
- Studies show people are concerned about future energy supply, impacts and costs
 - http://ec.europa.eu/public_opinion/archives/ebs/ebs_262_en.pdf
- But not well-informed on energy generation
 - http://www.publicagenda.org/files/energy_learning_curve.pdf
- And not informed about, but interested in fusion

Environmental Audience

- Environmental concern related to energy generation spans a number of issues
 - Climate change (global warming)
 - Pollution
 - Land use
 - Ecosystem damage from power generation
 - Ecosystem damage from resource extraction
- Concern about the ecological impact of renewable energy generation is increasing
 - http://www.ucsusa.org/clean_energy/our-energy-choices/renewable-energy/environmental-impacts-of.html#.VRDNCuF7Tqk
 - http://csis.org/files/publication/120918_Walton_EnvironConcerns.pdf

Humanitarian Audience

- Availability of cheap, abundant energy alleviates misery in third world countries by
 - Providing clean drinking water
 - The UN estimates that 783 million people (2013) don't have access to clean drinking water
 - Providing food
 - The UN estimates that almost a billion people (2010) go to bed hungry each night
 - Enabling economic advancement
- World peace—oil resources are increasingly a motivating factor in military conflicts

Educational Audience

- As awareness of climate change and energy demands have increased, so has interest in K-12 energy education
- The National Energy Education Development Project (NEED)
 - Provides energy education training to teachers
 - Provides over 130 teacher and student guides
- In 2012, the DOE established energy education standards
 - States are starting to follow by mandating a K-12 energy curriculum tied to the DOE standards
 - So far Massachusetts, Alaska, California, New York, Colorado and several other states have enacted energy education requirements

Futurist Audience

- Advanced energy technologies appeal to several demographics interested in technological advance
 - Scientists
 - Science fiction fans
 - Advocates of space exploration
 - Technologists
- The public at large has become conditioned to expect constant advances
 - Hollywood has set expectations for the future and people want to see these things in their lifetime

Nationalist Audience

- There are a number of geopolitical and nationalistic issues related to energy
 - Energy independence and self sufficiency
 - Reduce funding available to Islamic terror groups through petro dollars
 - Concerns about nuclear proliferation piggybacking on nuclear energy programs
- There is national pride and prestige at stake
 - The country that first demonstrates fusion energy will reap considerable benefits from being first

Market Analysis

- Global video game software sales
 - **\$64 billion** (2014)
 - Video games sales are projected to grow **11.8%** annually to **\$100 billion** by 2018
- The proposed game fits into the *business simulation* category
 - Other notable titles from this category
 - *SimCity* (1989, 1994, 1999, 2003, 2013)
 - *Railroad Tycoon* (1990, 1998, 2003, 2006)
 - *Roller Coaster Tycoon* (1999, 2002, 2004, 2012, 2014, 2015)
 - *Capitalism* (1995, 2001)

Market Analysis: US Sales

- In the United States, the video & computer game market is nearly **50%** larger than the film industry
 - US 2013 sales (billions \$): games **15.4**, movies **10.9**
- Video game consoles account for the lion's share of computer and video game sales in America
 - US 2013 units (millions): console **150.5**, computer **9.3**
 - However, globally, computer games are a significantly larger share than in the US

Market Analysis: Simulations

- Simulation games dominate the home computer game market
 - **8 of the top 12** computer games (US unit sales) in 2013 were simulations, including the #2 selling *SimCity 2013*
 - *Cities: Skyline*, hailed as the successor to the popular *SimCity*, was released on March 10, 2015
 - *Cities: Skyline* sold over **500,000** units (worldwide) in the first week

Market Analysis: Demographics

- Who plays games in America?
 - **59%** of Americans play video games
 - The average gamer is **31** years old
 - **71%** of gamers are **18** or older
 - **39%** of gamers are **36** or older
 - Nearly half (**48%**) of gamers are female
 - Women over **18** is the fastest growing demographic
 - Women age **18** or older represent a significantly greater portion of the game-playing population (**36%**) than boys age **18** or younger (**17%**)
 - **57%** of simulation game players are women

Competitive Analysis

- There are no energy simulation games available today or in the past that match the global scope nor the depth of simulation of the proposed game
- Contemporary simulation games with crossover target audiences fall into one or more of several categories
 - Energy generation simulation
 - City-scope energy simulation
 - Environmental climate change simulation
 - Resource extraction simulation
 - Environmental business simulation

Competitive Survey: Energy Generation Simulations

- These simulations model how a single plant or an energy source generates electricity
- Nuclear fission power plant
 - <http://playgen.com/play/dalton-nuclear-simulator>
 - <https://esa21.kennesaw.edu/activities/nukeenergy/nuke.htm>
 - <http://www.nuclearpowersimulator.com>
- Wind farm
 - <http://ecogamer.org/environmental-games/windmill-game>
- Solar panels
 - <http://www.solarpowersimulator.com>

Competitive Survey: City-Scope Energy Simulations

- These simulations model supplying energy to a single city, typically with a focus on green energy, sustainability and/or climate change
 - <http://ecogamer.org/premium-games/simcity-5-environmental-city-building-game>
 - <http://www.planitgreenlive.com>
 - <http://climcity.cap-sciences.net/us/index.php>
 - <http://ecogamer.org/environmental-games/enercities-energy-game>
 - Includes nuclear fusion plants
 - <http://ecogamer.org/environmental-games/energy-city>
 - <http://www.energyville.com/energyville>
 - <http://www.powermatrixgame.com/en>
 - <http://www.electrocity.co.nz>
 - <http://www-01.ibm.com/software/solutions/soa/innov8/cityone>

Competitive Survey: Climate Change Simulations

- The games primarily focus on climate change, but have an energy management component
 - <http://www.fateoftheworld.net>
 - <http://my2050.decc.gov.uk>
 - One of the closest competitors. Models energy and climate change in simulation that runs to 2050. Simulation is controlled by setting a dozen or so sliders.
 - <http://cmu.flintbox.com/public/project/4743>
 - <https://www.climateinteractive.org/tools/pangaea-our-decision-maker-oriented-climate-simulator>
 - <http://challengepost.com/software/intelligent-energy-choices-a-simulation-game-for-educating-the-public>
 - The closest competitor in terms of scope of simulation, but lacks interactive game play. Global energy and climate change simulation that models top 25 economies. Intended for educating the public.

Competitive Survey: Resource Extraction Simulations

- These games simulate the process of locating and extracting energy resources
 - Oil
 - <http://www.questforoil.com>
 - Natural gas
 - <https://dl.dropboxusercontent.com/u/36764/what-the-frack/index.html>

Competitive Survey: Ecological Business Simulations

- These games simulate running a business—either an ecological business or running some other business in an ecologically friendly manner
 - http://knowledge.allianz.com/ceo2/en_ext.html
 - Allows player to assume the role of the CEO of four different businesses, including a utility company.
 - <https://mitsloan.mit.edu/LearningEdge/simulations/cleanstart/Pages/default.aspx>
 - University education simulation game. Player assumes role of founder of startup company in clean energy sector.

Development Resources

- Lead designer, technical architect and project manager:
 - *Doug Bell*
- Energy modeling consultant:
 - *Tom Tamarkin*
- Lead developer, reports to Doug: TBD
 - Leads team of 3-4 game developers: TBD
- Art director, reports to Doug: TBD
 - Leads team of 2-3 artists: TBD
- Game designers (2), report to Doug
 - Create environments, characters, messaging, timeline, scripting for voice, game elements, and other game elements; contribute to UI and usability

Additional Development Resources

- Web site developer (6 months)
- Technical writer (3-4 months): TBD
- Voice actors (need TBD)
 - Minimum 1 male & 1 female
- Cover & promotional art work (need TBD)
- Localization services, including voice
- Play testers (3-4 in-house, 5 months)
- User testing and focus group moderator (2-3 months)

Pre-Launch Support Resources

- Promotions and marketing
- Prepare distribution channel (TBD)
- Manager of customer support (1 month)

Post-Launch Support Resources

- Web developer
- Customer service representatives
- Developer bug fixes and updates
- New features
- Secondary market localizations

Doug Bell

- Hall of fame pioneering game developer and technical director in 1980s and 1990s (FTL Games)
- Lead developer and designer of epic best-selling and critically acclaimed Dungeon Master series
 - Dozens of prestigious industry and media awards
 - *Computer Gaming World* Hall of Fame
 - 25 years later, fan base and clone market still active
- Lead developer/designer on four computer games
 - *Sundog*, *Dungeon Master*, *Chaos Strikes Back*, *Dungeon Master II: The Legend of Skullkeep*
 - All four were #1 sellers in US & international markets
- Over 30 years of development, project management, design and architecture experience in the software and video game industries

Tom Tamarin

- Proven entrepreneur, inventor and advocate in the energy, electronics, and computer industries
- Personal computer industry pioneer; founded Texcon in 1982
 - Inventor/developer of [*Allegro Mentor Teaching System*](#), an artificial-intelligence hardware and software system to teach playing the piano
- [*Founder & CEO, Utility Services Customer Link \(USCL\)*](#) since 1995
 - Inventor of “smart” electric, gas and water utility meters
 - Issued multiple [*patents in smart meter data communications and applications*](#) in US, EU, Israel, and China; additional patents pending
- 30 years experience in the electric, gas and water utility industry
 - Numerous utility industry awards
 - Named by *Smart Grid Today* as “Industry Pioneer”
 - Expert in power generation, pollution mitigation and data acquisition
 - Created [*Fusion4Freedom*](#) and [*PowerRfuture™*](#) web sites to increase public awareness and promote funding and research of fusion energy

Rough Development Schedule (1)

- Game design, facilities, talent and staff acquisition; 2-3 months
 - Doug, Tom, limited staff
- Create model view / animation; 2-3 months
 - Create basic energy scenario editor
 - Doug, developers, artists, game designers
- Basic energy scenario simulator; 4-8 weeks
 - Complete energy scenario editor
 - Doug, Tom, developers, artists, game designers

Rough Development Schedule (2)

- Create interactive game; 3 months
 - Create game manual and documentation for energy scenario editor and scenario modeling
 - Begin construction of web site
 - Doug, developers, artists, game designers, voice actors, play testers (internal), technical writer, web developer

Rough Development Schedule (3)

- Play testing, QA, polish, balancing; 2 months
 - Primary markets localization of text, graphics and voice
 - Perform usability testing and conduct focus groups
 - Pre- & post-launch support
 - Hire/train customer support
 - Promotions and marketing
 - Doug, Tom, developers, artists, game designers, play testers (internal, external), focus group moderator, localization services

Development Schedule Notes

- Total time from project initiation to product launch estimated at 10 to 13 months
 - Windows and Mac versions developed simultaneously—share as much as reasonable
- The key to creating a highly successful game is being flexible
 - Never release a game before it is ready
 - Must be critically honest with evaluation and get outside opinions and feedback

Stretch Goals and/or Future Expansions

- Online (web-based) version
- Multiplayer
 - Cooperative
 - Competitive
- Extended modeling
 - Government regulations
 - Climate change
 - Incorporate results of IPCC and competing models
 - World economy
 - Geopolitical

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In-Progress Activities

The remaining slides describe on-going and planned research, analysis, due diligence, and other tasks pursuant to funding, initiation and execution of the project.

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Budgeting

- The development requirements are understood well enough to budget
 - ***In progress***
- The business requirements and budget may be dependent on funding
 - Goal is to establish on-going game company
 - Business and support staffing and HR requirements dependent on business structure

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Determine Business Structure

- Business structure depends on what, if anything, investors bring to the table
 - If investor is game publisher or distributor, business could be set up as a game development studio
 - A utility-related business may present co-marketing and distribution opportunities
 - Venture capitalists may have expertise and requirements for setting up business structure
 - If investor is silent, need to set up as Power R Future™ game company division of USCL

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Marketing and Distribution Planning

- Marketing plans depend on distribution channels
- Distribution channels may be influenced by investor objectives
- Marketing and launch budgets depend on both of the above, as well as on sales projections and available funding

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Sales Projections

- Sales projections are always a dicey proposition in the entertainment industry
 - Quality, engagement and appeal of product have a **huge** influence on sales volume
 - These characteristics cannot be adequately assessed until late in the development process
 - Distribution and marketing impact sales
 - Viral pre-launch marketing success is difficult to predict, but can likewise have a **huge** impact on sales volume

Preparing for Crowdfunding

- The game project has the correct characteristics for a successful crowdfunding campaign
 - Crowdfunding is compatible with other investment funding
 - The same tactics that are effective for crowdfunding can be used for pre-launch viral marketing
- Separate effort required to reach each target audience
 - Identify organizations and influential members in each target audience
 - Promote game and get buy-in from these individuals so that they will use their forums to direct people to the crowdfunding site when we go live with the funding campaign
 - To the extent possible, seek feedback and input from these people as that greatly increases their engagement
 - These people will be reengaged for product launch

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Crowdfunding: Environmental Simulation Sites

- Establish contact with influentials at web sites that aggregate environmental simulation games
 - *EcoGamer* web site has reviews, descriptions and links to environmental simulation games
 - <http://ecogamer.org/environmental-games>
 - *The Polar Hub* web site has links to climate simulation games and simulations
 - <http://thepolarhub.org>
- Need to get pre-launch placement on sites

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Crowdfunding: Leverage Reputation (1)

- Leverage Doug Bell's reputation among fans of *Dungeon Master* and retro games
 - Classic (retro) game players
 - *Dungeon Master* fan sites
 - *Dungeon Master Encyclopedia*
 - <http://dmweb.free.fr>
 - *Dungeon Master Forums*
 - <http://www.dungeon-master.com>
 - <http://www.giantbomb.com/dungeon-master/3030-18518/forums>
 - <http://dungeonmasterjava.yuku.com>

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Crowdfunding: Leverage Reputation (2)

- Target *Dungeon Master* fan ports and clones
 - Amiga version
 - <http://game-oldies.com/play-online/dungeon-master-commodore-amiga>
 - DOS version (written in Java)
 - http://www.retrogames.cz/play_457-DOS.php
 - SNES (Nintendo) versions
 - <http://www.letsplaysnes.com/play-dungeon-master-online>
 - <http://www.vized.com/play/dungeon-master-snes-online-super-nintendo-7824-game>
 - Android version
 - <http://www.freegameempire.com/games/Dungeon-Master>

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Crowdfunding: Leverage Reputation (3)

- Target *Dungeon Master II (Skullkeep)* fan port
 - Android version
 - <http://www.freegameempire.com/games/Dungeon-Master-2>
- Target contemporary commercial games based entirely on *Dungeon Master* and its sequels
 - *Legend of Grimrock*, Windows & Mac versions
 - Released April 12, 2012; sold over 600,000 units by end 2012
 - <http://www.grimrock.net>
 - *Legend of Grimrock II*, Windows & Mac versions
 - Windows released on Oct. 15, 2014; Mac March 18, 2015
 - <http://www.grimrock.net>
- Target custom fan games based on *Dungeon Master*
 - *Return to Chaos*, Windows version
 - <http://ragingmole.com/RTC>

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Crowdfunding: Leverage Reputation (4)

- Discussion threads on recent articles and reviews of Dungeon Master and fan ports and clones
 - *RetroGamer* interview of Doug Bell (2007)
 - <https://drive.google.com/file/d/0B9Sz3oolAFfKUWJYUWlxaWJGYnBTNHHJHVEIxVIFHSThOc2Jj/view?usp=sharing>
 - *Abandonia* (review date unknown)
 - <http://www.abandonia.com/games/585>
 - *Rock, Paper, Shotgun* (March 29, 2012)
 - <http://www.rockpapershotgun.com/2012/03/29/you-could-be-playing-dungeon-master-right-now>

Investigate Recent Industry Events

- There have been recent (March 2015) developments in the simulation game space that present opportunities
 - On March 4, 2015 Electronic Arts shut down Maxis, the developer of *Sim City*
 - Valuable talent is on the market
 - The dominant competitor in the space is gone
 - On March 10, 2015 Colossal Order, a small Finnish game developer, released *Cities: Skylines*, a city-building simulation game hailed as the next *SimCity*
 - Sold more than 500,000 copies in its first week
 - Proves that simulation games still have strong appeal

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Competitive Analysis Deep Dive: Simulations (1)

- There are several simulation products on the market where we would like a deeper understanding of what they model and how
- CEO₂
 - A climate business game from Allianz
 - Play the CEO of an insurance, automotive, chemical or utility company
 - Run company from 2010-2030 while reducing CO₂

Competitive Analysis Deep Dive: Simulations (2)

- Windfall
 - Strategy game about building wind farms to create clean energy profitably
- EnerCities
 - City-scope energy and environment simulation game
 - Simulation includes nuclear fusion
- Power Matrix
 - A city-scope energy game sponsored by Siemens Energy
- C-ROADS, The climate rapid overview and decision support simulator
 - Freeware simplified climate simulator

Competitive Analysis Deep Dive: Simulations (3)

- Educational Global Climate Modeling
 - Research-grade global climate model from Columbia University
 - Has user interface for running on personal computer
- Cesim SimPower
 - Simulates energy industry, strategic management, risk management, regulation, power utilities, commodities
 - Used in college business and engineering classes
- Intelligent Energy Choices
 - Global energy and climate simulation game
 - Models top 25 economies
 - Player assumes management of one of the countries

Competitive Analysis Deep Dive: Game Play (1)

- Simulation games to evaluate for user interface and game play value
- Cities: Skyline
 - New, popular game that we will be compared to
 - Has very high production value for a simulation
- SimCity 5
 - Goals based on quality of life and sustainability
- Energy City
 - Targeted at education market

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Competitive Analysis Deep Dive: Game Play (2)

- Energyville
 - Sponsored by Chevron
 - City-scope game based on current energy
 - Includes modeling for North America, Europe and Asia
- My2050
 - One of the closest competitors in terms of goal
 - Models energy and climate change in simulation that runs to 2050
 - Simulation controlled by setting a dozen or so sliders
- CityOne
 - “Smart” city simulation game from IBM
- FuelFX
 - Refinery industry training simulation tool with advanced user experience that overlays live views with digital information
 - Works with Google Glass