Grand Challenges and Open Innovation

Cristin Dorgelo
Assistant Director for Grand Challenges
Office of Science and Technology Policy
Executive Office of the President
“...We’re pursuing...grand challenges like making solar energy as cheap as coal or making electric vehicles as affordable as the ones that run on gas. They’re ambitious goals, but they’re achievable. And we’re encouraging companies and research universities and other organizations to get involved and help us make progress.”

- President Obama
April 2, 2013
Benefits of Grand Challenges

1. Help solve important economic and societal problems
2. Serve as a “North Star” for high-impact, multi-disciplinary collaborations and public-private partnerships
3. Create the foundation for the industries and jobs of the future
4. Capture public imagination and increase support for public policies that foster science, technology and innovation
5. Inspire the next generation of scientists, engineers, and entrepreneurs
BRAIN RESEARCH THROUGH ADVANCING INNOVATIVE NEUROTECHNOLOGIES

BRAIN INITIATIVE

WHITEHOUSE.GOV
Current Public Sector Grand Challenges

Department of Energy: Clean Energy Grand Challenges

- **SunShot**: To make solar energy cost competitive with other forms of energy by 2020
- **EV Everywhere**: To make electric vehicles as affordable and convenient to own as gas-powered vehicles by 2020

USAID: Grand Challenges for Development

- **Saving Lives at Birth**: To increase access to primary health care for pregnant women and newborns by at least 50%
- **All Children Reading**: To have students in low-income countries leave primary school with basic reading skills
- **Powering Agriculture**: expand farmers’ access to clean energy solutions
Private Sector Grand Challenges

- **Google** – self-driving car (outgrowth of DARPA Challenge)

- **IBM** – AI that beats Gary Kasparov at chess, Ken Jennings at Jeopardy – Watson may create huge commercial markets

- **Qualcomm** – Tricorder X Prize

- **Elon Musk/SpaceX** – humanity should become a multi-planetary species – “I want to die on Mars”

- **Pronutria** – 10x or more increase in productivity for nutrition (output/acre)
1. **Foundations and donors**: organize philanthropic giving around Grand Challenges

2. **Universities**: organize research initiatives to meet ambitious Grand Challenge goals

3. **Companies**:
   - Identify a Grand Challenge they can contribute to
   - Sponsor major incentive prizes designed to address a Grand Challenge
   - Be early customers, provide capital, or provide mentoring to startups pursuing a Grand Challenge

4. **Angel, venture, and impact investors** can back **startups** that are pursuing Grand Challenges

5. **Media companies** and America’s **storytellers** can help make engineers and entrepreneurs pursuing Grand Challenges the rock stars of the 21st century
“No matter who you are, most of the smartest people work for someone else.”

- Bill Joy
  Cofounder
  Sun Microsystems
1919 Orteig Prize

Charles Lindbergh: Non-Stop Flight NY-Paris

 Aggregate Prize Purses over $100k

“[T]otal funds from large prizes have more than tripled over the last decade to surpass $375 million.”

And the winner is...

McKinsey 2009

Long Track Record of Spurring Innovation
“The Federal government should ... use high-risk, high-reward policy tools such as prizes and challenges to solve tough problems.”

-President Barack Obama
August 5, 2009
“Each head of an agency, or the heads of multiple agencies in cooperation, may carry out a program to award prizes competitively to stimulate innovation that has the potential to advance the mission of the respective agency.”

-Congress

December 21, 2010
On Challenge.gov, the public and government can solve problems together.

 Featured Challenges

 Startup America Policy Challenge

 by The White House

 Help knock down barriers to innovation and entrepreneurship in health care IT, clean energy, and learning technologies.

 3 months left to submit  LEARN MORE
Benefits of Prizes

1. Shine a spotlight on a problem or opportunity
2. Pay only for results
3. Target an ambitious goal without predicting which team or approach is most likely to succeed
4. Reach beyond usual suspects to tap top talent
5. Stimulate private sector investment many times greater than the prize purse
6. Bring out-of-discipline perspectives to bear
7. Inspire risk-taking by offering a level playing field
8. Establish clear target metrics and validation protocols
Prize Types from the McKinsey Report

1. Exemplar (recognition)
2. Point-solution
3. Exposition
4. Participation
5. Network
6. Market stimulation
Wendy Schmidt Oil Cleanup X Challenge

- Target: 2500 gpm at 70% efficiency, 2x today’s standard oil recovery rate
- 350+ narrowed down to 10 finalist teams
- $1,000,000 First Place Winner Elastec (Illinois)
- Achieved 4x today’s standard oil recovery rate in <6 months product development
- 4670 gallons per minute at 89.5% efficiency
AFRL Vehicle Stopper Challenge

• $25,000 for design for a system that could safely stop uncooperative fleeing vehicles without harm
• Solution in 60 days
• Winner was a retired 66-year-old mechanical engineer from Lima, Peru
• Solution was a remote electric-powered vehicle that can accelerate up to 130 mph within 3 seconds, position itself under a fleeing car, and then automatically trigger a restrained airbag to lift the car and slide it to a stop
Aspen Prize for Community College Excellence

- $1M prize to recognize community colleges with outstanding academic and workforce outcomes
- New body of data about community college programs
- Winner: Valencia College (FL)
- Four finalists-with-distinction:
  Lake Area Technical Institute (SD), Miami Dade College (FL), Walla Walla Community College (WA), and West Kentucky Community and Technical College (KY)
- Year 2 underway
**DARPA Shredder Challenge**

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International Space Apps Challenge

- Codeathon-style event led by NASA and many global partners
- Over 9000 participants took part in 83 cities around the world over 2 days
- More than 770 solutions for 58 challenges related to space exploration and social need
# Evaluating Impact of an Incentive Prize

## ROI
- Cost-effectiveness
- Financial leverage
- Time to solution

## SOLUTIONS
- Quantity
- Viability
- Diversity
- Performance improvement
- New approaches

## SOLVERS
- Quantity
- Quality/profile
- Diversity

## AWARENESS
- Earned media
- Social media
- Target audiences
- Stakeholder opinion

## IMPACT
- New community
- Market adoption
- Behavior change
- Decay rate
Trends & What’s Next

- Prizes in areas of social policy
- Competitions targeted at market adoption & behavior change
- Portfolio, staging, & laddering approaches
- Communities & solvers as ongoing assets
- More people with skills in prize design and administration
- Public-private partnerships for prizes
Thank You

challenges@ostp.gov

cdorgelo@ostp.eop.gov