# GTO Budget

<table>
<thead>
<tr>
<th></th>
<th>FY 2016 Enacted</th>
<th>FY 2017 Enacted</th>
<th>FY 2018 Enacted</th>
<th>FY 2019 Enacted</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Geothermal Technologies Office</strong></td>
<td>71,500</td>
<td>69,500</td>
<td>80,910</td>
<td>84,000</td>
</tr>
<tr>
<td>- Enhanced Geothermal Systems</td>
<td>45,000</td>
<td>42,700</td>
<td>50,790</td>
<td>53,000</td>
</tr>
<tr>
<td>- Hydrothermal</td>
<td>13,850</td>
<td>14,150</td>
<td>18,420</td>
<td>15,000</td>
</tr>
<tr>
<td>- Low Temperature &amp; Coproduced Resources</td>
<td>8,000</td>
<td>8,000</td>
<td>8,000</td>
<td>10,000</td>
</tr>
<tr>
<td>- Systems Analysis</td>
<td>3,700</td>
<td>3,700</td>
<td>3,700</td>
<td>6,000</td>
</tr>
</tbody>
</table>
FORGE is GTO’s flagship initiative to design and test a breakthrough approach to developing large-scale, economically sustainable EGS reservoirs.
Insight into reservoir creation and sustainability gained from EGS Collab directly supports FORGE research.

- Experiment 1 is ongoing at a depth of 4,850 feet.
- This first experiment focuses on hydraulic fracturing models and stimulation using LBNL’s SIMFIP tool.
## Play Fairway Analysis

<table>
<thead>
<tr>
<th>Drilling Site</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gabbs Valley, NV</td>
<td>Completed</td>
</tr>
<tr>
<td>Mount St. Helens, WA</td>
<td>Underway</td>
</tr>
<tr>
<td>Camas Prairie, ID</td>
<td>Underway</td>
</tr>
<tr>
<td>Dog Valley, UT</td>
<td>Fall 2018</td>
</tr>
<tr>
<td>Cove Fort, UT</td>
<td>Fall 2018</td>
</tr>
<tr>
<td>Granite Springs, NV</td>
<td>Fall 2018</td>
</tr>
<tr>
<td>Lanai, HI</td>
<td>January 2019</td>
</tr>
<tr>
<td>Mt Baker, WA</td>
<td>Spring 2019</td>
</tr>
</tbody>
</table>

0 50 100 200 Miles

- Mt Baker, WA - Spring 2019
- Mount St. Helens, WA - Underway
- Camas Prairie, ID - Underway
- Dog Valley, UT - Fall 2018
- Cove Fort, UT - Fall 2018
- Granite Springs, NV - Fall 2018
- Lanai, HI - January 2019
- Mt Baker, WA - Spring 2019

Lanai

Granite Springs

Mt St. Helens

Camas Prairie

Gabbs Valley

Dog Valley

Cove Fort
**Deep Direct-Use**

**ENERGY INSTITUTE**
- WVU Facilities Management
- West Virginia Geological & Economic Survey
- Lawrence Berkeley National Laboratory
- Cornell University

**Portland State University**
- AltaRock Energy
- City of Portland
- Oregon Health & Science University
- U.S. Geological Survey

**Six research teams are currently assessing DDU feasibility**

<table>
<thead>
<tr>
<th>Location</th>
<th>Site or City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appalachian Basin</td>
<td>WV and NY sites</td>
</tr>
<tr>
<td>Wassuk Range</td>
<td>Hawthorne, NV</td>
</tr>
<tr>
<td>Columbia River Basalt</td>
<td>Portland, OR</td>
</tr>
<tr>
<td>Cotton Valley</td>
<td>East Texas</td>
</tr>
<tr>
<td>Illinois Basin</td>
<td>Champaign-Urbana, IL</td>
</tr>
</tbody>
</table>

**U.S. DEPARTMENT OF ENERGY       OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY**

**University of Wisconsin-Madison**
- Loudon Technical Services
- U.S. Army CER Laboratory
- MEP Associates
- Illinois Geothermal Engineering, Inc.
- Trimeric

**Sandia National Laboratories**
- U.S. Navy Geothermal Program
- Power Engineers, Inc.
- University of Nevada-Reno

**NREL**
- Southern Methodist University
- Eastman Chemical
- TAS Energy
- Electric Power Research Institute
2018: A Strong Push in Research Investment

Zonal Isolation
• C-Crete Technologies
• Fervo Energy
• Hotrock (HERO)
• Welltec Inc.

Waterless Stimulation

Beyond Batteries
• BNL
• INL
• LBNL
• NREL
• ORNL

Machine Learning
• Selections announced early 2019

EDGE
• ANL
• SNL
• General Electric
• Oklahoma State
• Texas A&M
• U of Oklahoma
A Glimpse Ahead

Drilling at the FORGE site near Milford, Utah

Play Fairway Analysis drilling will continue in 2019

2019
Personnel Changes

Congratulations to Eric Hass and Holly Thomas on their retirements from GTO - thank you for your devoted service to geothermal research and development!

After many years of outstanding service, Dr. Timothy Unruh has moved on from Deputy Assistant Secretary for Renewable Power to pursue a new role with NAESCO.
Thank You!
Visit us at Booth 218