Energy is a fundamental crosscutting concept in science and is a social and environmental concern as demand for energy increases globally. In the 4-H Energy Management project, members may work on a variety of topics, including:

- Explore types of energy, including thermal (heat), chemical, magnetic, elastic, electrical, sound, radiant, mechanical, nuclear, and luminous, and how they may be transformed.
- Practice and promote wise use of energy, taking into consideration social, economic, environmental, and political considerations.
- Develop an understanding of energy production and the social, political, and economic costs between petroleum (oil), natural gas, coal, nuclear, and renewable sources.

### Starting Out (Beginner)
- Learn about forms of energy and transformation from one form to another.
- Explore how much energy is needed to perform certain tasks (i.e., energy usage).
- Start to experience the flow of energy into and out of a system.
- Understand the production, selection, use, conservation and safe handling of energy.

### Learning More (Intermediate)
- Explore the ways humans use and generate energy and how that has changed over time.
- Learn about renewable energy sources (sunlight, wind, rain, tides, water, and geothermal heat).
- Develop an appreciation and respect for the environment, rights and property of people and human responsibility in the production and use of energy.

### Exploring Depth (Advanced)
- Explore energy generation and the cost/benefits of various sources of energy.
- Learn about the impact of energy production on climate change.
- Learn about sustainable energy and energy efficiency.
- Conduct a community energy assessment and develop a service learning plan to save energy.

The activities above are ideas to inspire further project development. This is not a complete list.

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### 4-H THRIVE

#### Help Youth:

**Light Their Spark**

A spark is something youth are passionate about; it really fires them up and gives them joy and energy. Help youth find how this project excites them.

**Flex Their Brain**

The brain grows stronger when we try new things and master new skills. Encourage youth effort and persistence to help them reach higher levels of success.

**Reach Their Goals**

Help youth use the GPS system to achieve their goals.

- **Goal Selection:** Choose one meaningful, realistic and demanding goal.
- **Pursue Strategies:** Create a step-by-step plan to make daily choices that support your goal.
- **Shift Gears:** Change strategies if you’re having difficulties reaching your goal. Seek help from others. What are youth going to do when things get in their way?

**Reflect**

Ask project members how they can use their passion for this project to be more confident, competent and caring. Discuss ways they can use their skills to make a contribution in the community, improve their character or establish connections.
Expand Your Experiences!

**Science, Technology, Engineering, and Mathematics**
- Build an object that converts one form of energy to another; assess its efficiency.
- Conduct an experiment with light bulbs to see how much energy each consumes.
- Learn the history of energy generation technologies.
- Go on a field trip of an electrical generation plant.

**Healthy Living**
- Learn how your body uses and transforms energy—how many steps would it take to power a light bulb? How efficient is your body at transforming energy?
- Explore the calorie unit of energy, what it means, and its relation to your body and health.
- Conduct an assessment of the impact of energy production on the environment.

**Citizenship**
- Conduct an energy assessment of your community and present your findings to the city council; encourage them to explore more renewable sources of energy production.
- Start a recycling campaign for old sources of energy, like batteries.
- Inform the public about ways to reduce energy consumption.

**Leadership**
- Become a Junior or Teen Leader for the 4-H Energy Project.
- Be a role model in reducing your electricity usage at home, school, and 4-H meetings.
- Learn about the complex roles of social, economic, political, and environmental factors involved in energy generation.

<table>
<thead>
<tr>
<th>Connections &amp; Events</th>
<th>Curriculum</th>
<th>4-H Record Book</th>
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<tbody>
<tr>
<td><strong>Presentation Days</strong> – Share what you’ve learned with others through a presentation.</td>
<td><strong>Power of the Wind</strong> <a href="http://www.4-h.org/resource-library/curriculum/4-h-the-power-of-the-wind/">www.4-h.org/resource-library/curriculum/4-h-the-power-of-the-wind/</a></td>
<td>4-H Record Books give members an opportunity to record events and reflect on their experiences. For each project, members document their experiences, learning and development.</td>
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<tr>
<td><strong>Field Days</strong> – At these events, 4-H members may participate in a variety of contests related to their project area. Contact your UC Cooperative Extension Office to determine additional opportunities available, such as a field day.</td>
<td><strong>4-H National Youth Science Days</strong>—Biofuel Blast (2009) and Wired for Wind (2011) <a href="http://4h.ucanr.edu/Projects/SET/NYSID/2009_4-H_NYSID/">http://4h.ucanr.edu/Projects/SET/NYSID/2009_4-H_NYSID/</a></td>
<td>4-H Record Books also teach members record management skills and encourage them to set goals and develop a plan to meet those goals.</td>
</tr>
<tr>
<td><strong>4-H Biodiesel Curriculum</strong> web.cals.uidaho.edu/biodiesel/4-h-curriculum-for-ages-8-12/</td>
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</table>

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**Resources**
- Renewable Energy Scavenger Hunt [www.4-h.org/WorkArea/DownloadAsset.aspx?id=4242](http://www.4-h.org/WorkArea/DownloadAsset.aspx?id=4242)
- National Academies— Energy needtoknow.nas.edu/energy/

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