1. CLEAN Triage Form

Does resource address the CLEP or energy awareness?

- [ ] 4 Definitely
- [ ] 3 Somewhat
- [ ] 2 A Little
- [ ] 1 No
- [ ] Not Applicable

If this resource addresses a foundational concept but does not explicitly draw the connection to climate/energy then it should be put in holding with a note to that effect Essential Principles of Climate and Energy Literacy

Select the primary principle(s) that are addressed by the resource.

- [ ] 1 The Sun is the primary source of energy for Earth's climate system
- [ ] 2 Climate is regulated by complex interactions among components of the Earth system
- [ ] 3 Life on Earth depends on, is shaped by, and affects climate
- [ ] 4 Climate varies over space and time through both natural and man-made processes
- [ ] 5 Our understanding of the climate system is improved through observations, theoretical studies, and modeling
- [ ] 6 Human activities are impacting the climate system
- [ ] 7 Climate change will have consequences for the Earth system and human lives
- [ ] (8) Humans can take actions to reduce climate change and its impacts.
- [ ] Addresses Energy Awareness
- [ ] Addresses CLEP/Energy Solutions

Type of Resource

Please select the type of material that is contained in the website you are recommending.

- [ ] An educational activity such as a project, assignment, interactive lecture or classroom activity

A relatively brief set of instructional materials that is presented as a whole, where all the parts and ideas are linked and part of the same activity.

Resources other than teaching activities will not be considered in the initial CLEAN review. If the resource is not an activity but of merit select the appropriate resource type here and select the appropriate 'holding' category below.

- ☐ Course Information
- ☐ Set of Activities/Curriculum (these should be put in holding for now)
- ☐ Data or Tool
- ☐ Audio/Video (map, animation, podcast, video, image)
- ☐ Policy Resources
- ☐ Scientific Reference (paper, bibliography, reference work)
- ☐ Computer Application (e.g. GIS tool)

Audience Level

Is the resource appropriate for grade level 6-16

- ☐ Yes
- ☐ No
- ☐ Not Applicable

Please select the **stated** target grade level for this material. Check all that apply.

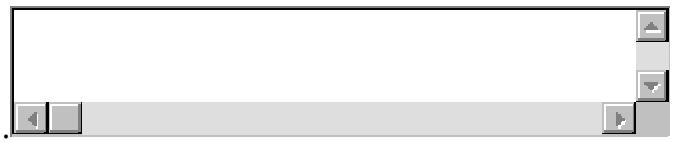
Judgements about the actual appropriate grade level will be made in later review. If there's an obvious discrepancy make note of it below.

- ☐ Primary (K-2)
- ☐ Intermediate (3-5)
- ☐ Middle (6-8)
- ☐ High School (9-12)
- ☐ College Lower (13-14)
- ☐ College Upper (15-16)
- ☐ Graduate or Professional
- ☐ Informal Education (museums, park displays)
- ☐ No grade level information provided

Items of high quality that don't meet the needs of the current collection can be put in holding. Low quality (or very off-topic) resources should be marked as inappropriate. Result of Initial Vetting

- Highly Recommended for Review
- Recommended for Review
- Holding-Too Large (course, curricula)
- Holding-Too Small (data, visualization)
- Holding-Informational, not activity
- Holding-Out of Scope (subject/grade)
- Holding for other reasons (describe below)
- Inappropriate - Seems Scientifically Inaccurate
- Inappropriate - Seems Pedagogically Flawed
- Inappropriate -other (describe below)
- Unvetted (default value when this form has yet to be completed)

Additional description or comments. If item is put in holding or deemed inappropriate indicate why. (e.g. "seems to have major scientific inaccuracies")



2. CLEAN Review Form

Scientific Accuracy

Is an attribution provided that represents a credible source such as a university or government agency?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Resource is free of scientifically out-of-date material.

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Does the resource clearly identify assumptions and distinguish between observations/facts and interpretation/hypothesis?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Does the resource present valid/accurate concepts, models, and skills?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

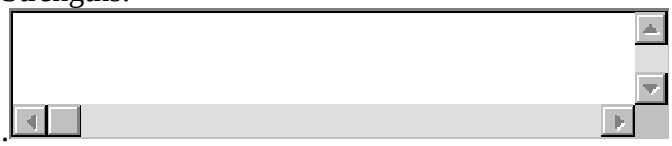
Are links to the original data sources provided?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Where appropriate, are references, bibliographies and other supporting material provided?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no

Strengths:



Concerns:

Overall Rating of Scientific Accuracy

- Meets highest scientific standards, up-to-date e.g. IPCC 4th report
- Scientifically sound but does not meet highest standards
- Minor scientific short-comings that can be addressed in annotations
- Has major scientific short-comings or even conveys misconceptions
- Can’t answer this

Pedagogic effectiveness

Are learning objectives clearly stated?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Do the instructional strategies build toward mastering the learning objectives?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Does the resource accommodate different learning styles?

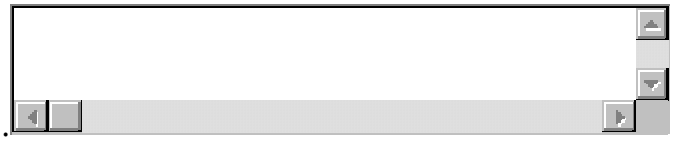
- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

comments on how the resource addresses different learning styles

Does the resource explicitly address the needs of underserved groups?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

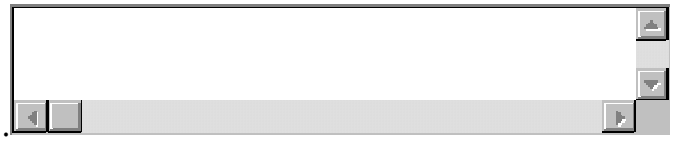
comments on how this resource addresses the needs of underserved groups



Is the resource free from material that might interfere with effective use by a wide range of learners (e.g. negative stereotypes or insensitive treatment of sensitive subjects)

- 4 yes
- 1 no
- can not answer

Comments



Are prerequisite skills and understandings accurately indicated?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Does the resource effectively address common preconceptions/misconceptions?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Are effective assessment strategies suggested?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Is the resource engaging and motivating for students? Does it provide compelling and relevant reason to jump into the activity?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

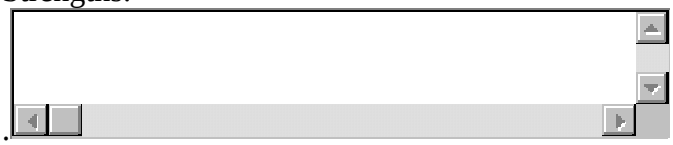
Are students engaged in inquiry, independent thinking or problem solving through this resource?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Does the resource provide a vehicle for asking questions or seeking further information beyond the activity?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

Strengths:



Concerns:

Overall Rating of Pedagogic Effectiveness

- Pedagogically very effective and carefully designed, well documented, suitable target audience
- Pedagogic design is good and resource is useful as a learning tool for target audience, minor pedagogic short-comings

- [ ] Pedagogical design does meet basic standards but has considerable shortcomings
- [ ] Poor pedagogical design, not recommended as a learning tool for target audience
- [ ] Can’t answer this

Ease of use & technical quality

Is the resource free of distracting or off-topic advertising?

- [ ] 4 definitely
- [ ] 3 somewhat
- [ ] 2 a little
- [ ] 1 no
- [ ] not applicable

Is the resource complete in scope and ready for use?

- [ ] 4 definitely
- [ ] 3 somewhat
- [ ] 2 a little
- [ ] 1 no
- [ ] not applicable

Are the materials used in the resource commonly found in science classrooms?

- [ ] 4 definitely
- [ ] 3 somewhat
- [ ] 2 a little
- [ ] 1 no
- [ ] not applicable

Does the resource present the concept and content clearly?

- [ ] 4 definitely
- [ ] 3 somewhat
- [ ] 2 a little
- [ ] 1 no
- [ ] not applicable

Will students be able to complete this activity without excessive additional instruction or technical support from the teacher?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

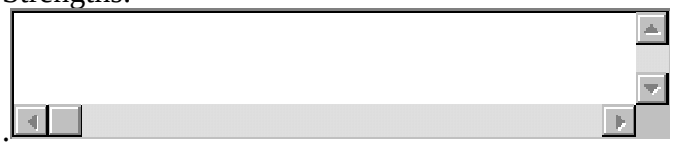
Does the resource provide a clear and comprehensive guidance for teachers to effectively teach the activity?

- 4 definitely
- 3 somewhat
- 2 a little
- 1 no
- not applicable

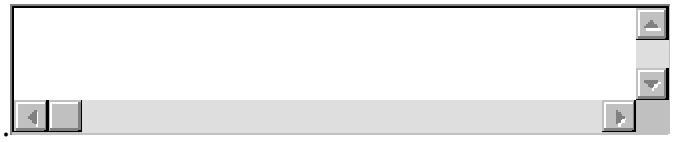
Is necessary material available in printable hand-out form?

- 4 Yes
- 1 No
- not applicable

Strengths:



Concerns:



Overall Rating of Technical Quality

- Technically robust and adequate for use in typical educational environment
- Technically good, minor shortcomings in technical aspects when used in typical educational environment
- Technically weak, minor problems when used in typical educational environment

- [ ] Technically weak, major problems when used in typical educational environment
- [ ] Not Applicable
- [ ] Can’t answer this

Overall Rating of Ease of Use

- [ ] Very easy and intuitive to use for students and teachers, grade-level appropriate design
- [ ] Fairly easy to use for students and teachers
- [ ] Careful guidance of students through material needed
- [ ] Easy to get lost in material, counter-intuitive and/or not grade-level-appropriate
- [ ] Can’t answer this

Essential Principles of Climate and Energy Literacy

Select the primary principle(s) that are addressed by the resource.

- [ ] **GP Humans can take actions to reduce climate change and its impacts.**
- [ ] GP a Climate science improves informed policy and decision-making
- [ ] GP b Reducing human vulnerability to and impacts on climate requires multi-disciplinary, integrated understanding
- [ ] GP c Climate change affects global/national security
- [ ] GP d Greenhouse gas reduction and carbon dioxide sequestration to mitigate climate change
- [ ] GP e Strategies to reduce greenhouse gas emission (energy conservation, renewable energies, change in energy use)
- [ ] GP f Strategies of human adaptation to climate change
- [ ] GP g Actions taken by different levels of society can mitigate climate change and increase preparedness for current and future generations

- [ ] **1 The Sun is the primary source of energy for Earth's climate system**
- [ ] 1a Sunlight warms the planet
- [ ] 1 b Earth’s Energy balance
- [ ] 1 c Axial tilt of Earth governs incoming sunlight and seasonality
- [ ] 1 d Milankovitch/orbital cycle
- [ ] 1 e Solar variability has no significant impact on Earth’s current warming

- [ ] **2 Climate is regulated by complex interactions among components of the Earth system**

- [ ] 2 a World's climate definition
- [ ] 2 b Ocean as climate control, oceanic conveyor belt; abrupt changes in thermohaline circulation
- [ ] 2 c Greenhouse effect
- [ ] 2 d Biogeochemical cycles of greenhouse gases / Carbon cycle
- [ ] 2 e Role of aerosols in climate system
- [ ] 2 f Equilibrium and feedback loops in climate system

- [ ] **3 Life on Earth depends on, is shaped by, and affects climate**
- [ ] 3 a Climate's role in habitats ranges and adaptation of species to climate changes
- [ ] 3 b The Greenhouse effect supports the water cycle and makes life possible
- [ ] 3 c Climate impacts ecosystems and past species extinctions
- [ ] 3 d Holocene is unusually stable – human infrastructure vulnerable to change
- [ ] 3 e Biosphere drives the global carbon cycle

- [ ] **4 Climate varies over space and time through both natural and man-made processes**
- [ ] 4 a Definition of climate and climatic regions
- [ ] 4 b Climate is not the same thing as weather – defining difference
- [ ] 4 c Climate change vs. climate variability and patterns
- [ ] 4 d Changes in climate is normal but varies over times/ space
- [ ] 4 e Global warming and especially arctic warming is recorded in natural geological and historic records
- [ ] 4 f Evidence is that human impacts are playing an increasing role in climate change
- [ ] 4 g Natural processes of CO2 removal from atmosphere is slow; Long residence time of some GHG

- [ ] **5 Our understanding of the climate system is improved through observations, theoretical studies, and modeling**
- [ ] 5 a Climate system is subject to the same physical laws as the rest of the Universe
- [ ] 5 b Observations are the foundation for understanding the climate system
- [ ] 5 c Observations, experiments, and theory are used to construct and refine computer models
- [ ] 5 d Meteorology and climatology are related but different sciences, and their processes are modeled and forecast differently
- [ ] 5 e Climate models are robust enough to be used for guiding decision and actions as

response to climate change

☐ **6 Human activities are impacting the climate system**

☐ 6 a Global warming is "very likely" caused by human greenhouse gas emission

☐ (6 b) Increased GHG concentrations in atmosphere will remain high for centuries and affect future climate

☐ 6 c Human activities have increased GHG levels and altered global climate patterns

☐ 6 d Evidence shows that human-caused global warming have impacted ecosystem resulting in reduced biodiversity and ecological resilience

☐ 6 e Negative impacts of global warming outweigh positive

☐ **7 Climate change will have consequences for the Earth system and human lives**

☐ 7 a Sea level rise and resulting impacts is due to melting ice and thermal expansion and increases the risk

☐ 7 b Effects of climate change on water cycle and freshwater availability

☐ 7 c Increased extreme weather events due to climate change

☐ 7 d Increased acidity of oceans and negative impacts on food chain due to increasing carbon dioxide levels

☐ 7 e Ecosystems on land and in the ocean have been and will continue to be disturbed by climate change

☐ 7 f Human health and well-being will be affected to different degrees from the impacts from climate change

☐ **Addresses Energy Awareness**

☐ A. Energy drives the Earth System

☐ B. Primary sources of energy used by society are non-renewable and renewable sources

☐ C. Humans' use of energy has consequences on the environment

☐ D. Distribution of energy sources varies around the planet, resulting in distribution and transmission costs

☐ E. Human use of and access to energy result in social, political and equity issues

☐ F. Informed decision-making, technological and societal innovation and improved efficiency needed to reach sustainability

☐ Addresses CLEP/Energy Solutions (this is superceeded by the energy terms above)

Audience Level

Please select the grade level for which this material is most appropriate (in your judgement) Check all that apply.

- ☐ Primary (K-2) (note that this grade range is out of scope for CLEAN)
- ☐ Intermediate (3-5) (note that this grade range is out of scope for CLEAN)
- ☐ Middle (6-8)
- ☐ High School (9-12)
- ☐ College Lower (13-14)
- ☐ College Upper (15-16)
- ☐ Graduate or Professional
- ☐ Informal Education (museums, park displays)

Overall Rating of Relevance to CLEAN

- ☐ High Priority (Resource likely to be included in CLEAN collection of excellent resources)
- ☐ Medium Priority (Resource meets basic CLEAN standards)
- ☐ Low Priority (Resource meets basic CLEAN standards but is of lower priority)
- ☐ Hold for Later Review (Keep in pool for another review at later stage)
- ☐ Excellent but Incomplete (Excellent and relevant but needs improved activity sheet)
- ☐ Do Not Include (Resource doesn't meet basic CLEAN standards)
- ☐ Review in process (not yet complete)
- ☐ Unvetted (Review not yet complete)

Other Reviewer Comments