



THE CLIMATE LITERACY AND ENERGY AWARENESS NETWORK (CLEAN)

Evaluation Summative Report
Extended Executive Summary

INVERNESS RESEARCH
February 2014

Introduction

Funded by the National Science Foundation (NSF), the Climate Literacy and Energy Awareness Network (CLEAN) Pathways Project is a partnership among experts at TERC, the National Oceanic and Atmospheric Administration (NOAA), the Cooperative Institute for Research in Environmental Sciences (CIRES), the National Renewable Energy Laboratory (NREL), and the Science Education Resource Center at Carlton College (SERC). Over three years (2011–2013), CLEAN developed, refined, and implemented a rigorous process by which national experts in climate and/or energy science and education were convened to collect and review teaching resources. These resources are each linked to AAAS' Benchmarks for Science Literacy and the former National Science Education Standards. The process has been documented extensively by the CLEAN team,¹ and has resulted in more than 580 extensively vetted, high-quality educational resources available on the CLEAN website (www.cleannet.org).

CLEAN has also created resources that are specifically aimed at assisting educators in their planning for and teaching about climate and energy, supported professional development around the use of the resource collection, and become the home of the national Climate Literacy Network (formerly CLN, now CLEAN). While the network was active prior to CLEAN, the work of the project helped create a larger virtual community; the story of the development of this national educational community has also been well documented by the project leadership.²

Inverness Research served as the external evaluator for the CLEAN project from 2010–2013. The central focus of our evaluation work was to provide project leaders with information about their target audience and to study how this audience responded to the CLEAN resources. This information gathering was accomplished through the creation of a large national “informant group” consisting of approximately 200 educators from around the country—a random, but climate-attentive sample of instructors at grades 6 through 16. Over the course of the grant, and as the website developed, the educator informants provided feedback (via surveys and interviews) about the CLEAN website itself as well as information about their teaching context, teaching practice, and their use of resources and other supports for their teaching. These data provide a three-year view of the “national landscape” of climate and energy education, and a grounded perspective on the needs and interests of the CLEAN target audience as well as their responses to its website. The informant data, along with interviews with climate and energy experts and CLEAN leaders, provide the majority of the data for this report. In addition, we draw from internal evaluation reports where applicable.

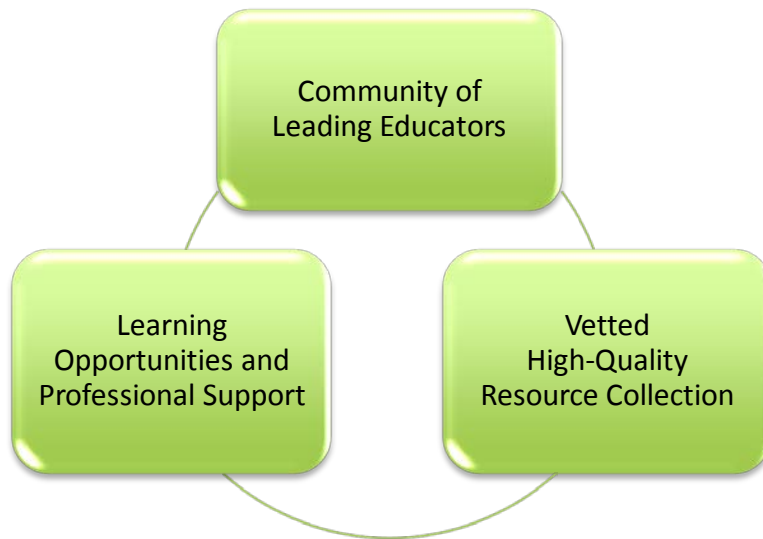
Very broadly, Inverness Research's study paints the story of an educator group that felt both capable and moderately well served prior to their exposure to CLEAN. However, this group recognized and valued the rigorous process through which CLEAN resources were vetted, and

¹ Gold, A. U., Ledley, T. S., Buhr, S. M., Fox, S., McCaffrey, M., Niepold, F., Manduca, C. A., and Lynds, S. E. (2012). Peer-review of digital educational resources—a rigorous review process developed by the Climate Literacy and Energy Awareness Network (CLEAN). *Journal of Geoscience Education*, 60, 295-308.

² Ledley, T. S., Gold, A., Niepold, F., McCaffrey, M., Sullivan, S. B., Manduca, C. A., Fox, S. (2013) *Moving Toward Collective Impact in Climate Change Literacy – The Climate Literacy And Energy Awareness Network (CLEAN)*. Unpublished manuscript.

they reported benefitting from their connection with the CLEAN educational and professional resources. At the same time, the informant group valued becoming part of a community of educators committed to ongoing improvement of climate and energy education.

We view the project’s work and contributions as a synergistic relationship among three key elements: professional community of leading climate and energy educators (including resource developers); vetted, high-quality resources; and learning opportunities and professional supports:



For our evaluation, we drew on the expertise of CLEAN project leaders to define the terms *climate science* and *energy awareness* for our surveys and interviews:

Climate Science is the study—through observations, theories and modeling of complex interactions—of the atmosphere, lithosphere, hydrosphere, cryosphere, biosphere and effects of human activities on the Earth’s climate system.

Energy Awareness is understanding the complex physical, technical, social and environmental context of energy in our lives, and being able to make informed, evidence-based decisions from this understanding.

In our data-gathering instruments we separated climate and energy just as they are treated on the CLEAN website, each with distinct essential principles and rationales for inclusion in the curriculum. CLEAN leaders were interested in finding out if educators had different perspectives on teaching climate and energy and if they experienced different kinds of affordances and constraints with respect to teaching these two topics.

The Need for the CLEAN Resource Collection

According to our informant group and expert interviews, there is a need in the climate education field for high-quality teaching resources at all levels, particularly those that emphasize the use of real data and hands-on experiences for students. These resources are also needed to improve and enhance the knowledge level of instructors, particularly at the lower grades. In addition, there is a need for resources that can be used in professional development settings. Study data reveals the following points:

- There is no need to convince our informants, for the most part, about the reality of climate change—a large majority (93% in 2013) agree that it is happening. However, some in our sample are less knowledgeable about certain facts than others, especially middle school teachers. And there is a sense among our experts that there are gaps in teachers' knowledge about the climate that need to be addressed. Therefore, there may be an opportunity to improve the knowledge level of these teachers through their use of the CLEAN website.
- Informants report that while there are “good,” “available” teaching resources, there is a need for more resources that are designed to meet student interests as well as the instructional preferences of teachers. Informants noted that there is a need for materials that help students understand basic concepts about climate and energy, and that hands-on activities are particularly needed at all levels.
- Informants at all grade levels perceive that students are interested in the issues first and the science second. And they are most interested in hands-on or lab activities, more so at the lower grade levels. More advanced students are less interested in hands-on, and interest in viewing documentaries and reading popular articles increases as students progress through the grades.
- Many of the informants in our study also provide professional development to other teachers (67%). These instructors reported a need for more time and for well-designed resources to provide the highest quality professional development.
- Experts report that teachers need a way to filter and make good judgments about the many online resources related to climate and energy education.

Overall, based on feedback from our informants as well as interviews with project leaders and field experts, there is a great need in the field for more and better resources for teaching about the climate. (See the full report for more details.)

Development of the CLEAN Resource Collection

The CLEAN resource review process involved intensive face-to-face meetings (called camps) held over several days, where experts in climate/energy science, education, or both met to review resources using criteria developed by the project. The resource review camps were designed to result in a collection of the highest quality annotated resources available on the Internet. While it proved to be an expensive and somewhat arduous process overall, the CLEAN leadership believes that it was well worth the effort, as they now have—in addition to the collection—a set of tested criteria against which resource developers can hold their work. (This process has been documented by the project in a paper published in 2012 as referenced earlier in this report.)

Over the course of the project, two national face-to-face review camps, two regional face-to-face review camps, four virtual review camps, and one “mini” virtual camp (four people for one hour) were convened and facilitated. By the end of the project funding, this process resulted in ~580 vetted resources. In addition, the project facilitated one contracted review camp with the Long Term Ecological Research Network (LTER), which is building its own digital library.

Additional findings about the value of the review process include:

- Rigorous review of the resources by both scientists and educators is important to users. Though it was not ranked as a top consideration when choosing a resource, educators’ interest in high-quality materials they can trust, that are not over politicized, that are usable, etc., calls for a sophisticated vetting process.
- The development of the review criteria is a major outcome of the project—both in that it was a professional development experience for the people who participated in the review process, and the criteria themselves have the potential to influence the development of resources in the future. These criteria have set a standard for quality products that developers can use to create new materials that will have a “stamp of approval” for inclusion in the CLEAN collection.
- The process of scouring the Internet for teaching resources about climate and energy revealed that while there are many products available, gaps and “thin spots” in the landscape become apparent when the body of available resources is held up against the new frameworks for teaching climate and energy. This analysis is an equally important contribution to the field and provides resource developers a guideline for future development.
- In an effort to reduce the cost and increase the efficiency of the process, the review camps were eventually taken entirely online. The process has been refined to the point where it can be used in other contexts.

Access to and Use of the CLEAN Collection

Overall, as people access and use the CLEAN collection it becomes a “go-to” source of support for their teaching about climate and energy. With few exceptions, the website itself is designed well, easy to follow and use, and contains appropriate and trustworthy resources. (See the full report for more details.)

Access to the CLEAN collection

Informants and field experts report that the CLEAN website is easy to use, is well designed, easy to search, and provides sufficient information for using the resources or for helping educators generate new ways of teaching climate and energy. Secondary level educators found it more appropriate for their teaching level than post-secondary.

Additional feedback about the site design and access includes:

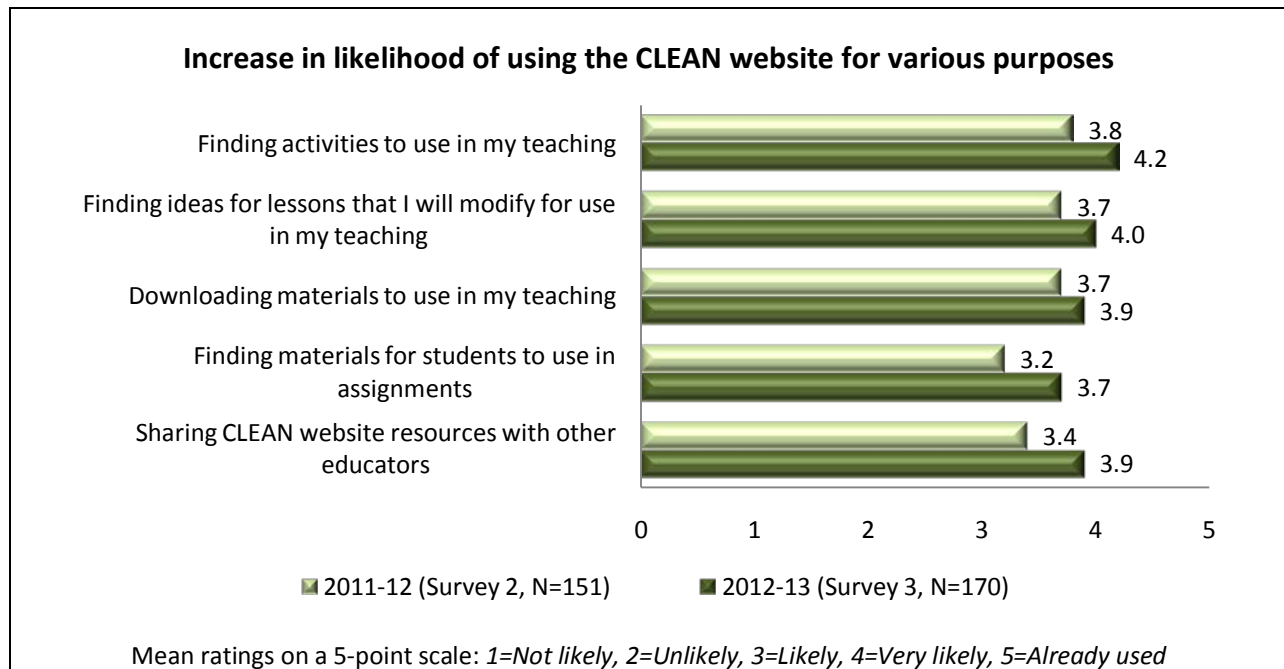
- Most sections were easy for users to find.
- The site architecture overall and the landing page and left menu bar specifically were reported as easy to find and use.
- Informants offered some specific suggestions for improving access.
- Comments on the design of the site were mostly positive, and any negative comments were related to site navigation, missing resources, noted inaccuracies, or out-of-date resources.

Use of the CLEAN collection

Educators’ use of the CLEAN collection varied by grade level and purpose. A key finding of our study is that usage increased once people were asked to try it, in particular after they were asked to search for something that they would actually want to use in their teaching. By 2013, CLEAN was among the top five sources of materials for teaching climate and energy for our informant group. And, overall, while traffic to the site is relatively light, it has steadily increased over time (as measured by Google Analytics). Details about use of the collection include:

- Use of the CLEAN website by grade level
 - **Middle school teachers** tend to use CLEAN when looking for help with teaching a topic, for resources that align with standards, and for particular pedagogical approaches (e.g., small groups).
 - **High school teachers** tend to use CLEAN when looking for help with teaching a topic, or for resources to augment a lesson (e.g., real data).
 - **College teachers** tend to use CLEAN to search for topics related to the subjects they teach.
- Purposes for using the CLEAN website increase with time and use. We identified five purposes for which educators were significantly more likely to use the site in 2012–2013

than in 2011-2012, shown in the following graph.



- Web statistics, according to Google Analytics, show:
 - The number of new and unique visitors increased by 55% from 2012 to 2013.
 - Key referral sources include energy.gov, acespace.org, and climate.gov.
 - Tablet and mobile access has increased, more so than desktop computer access.

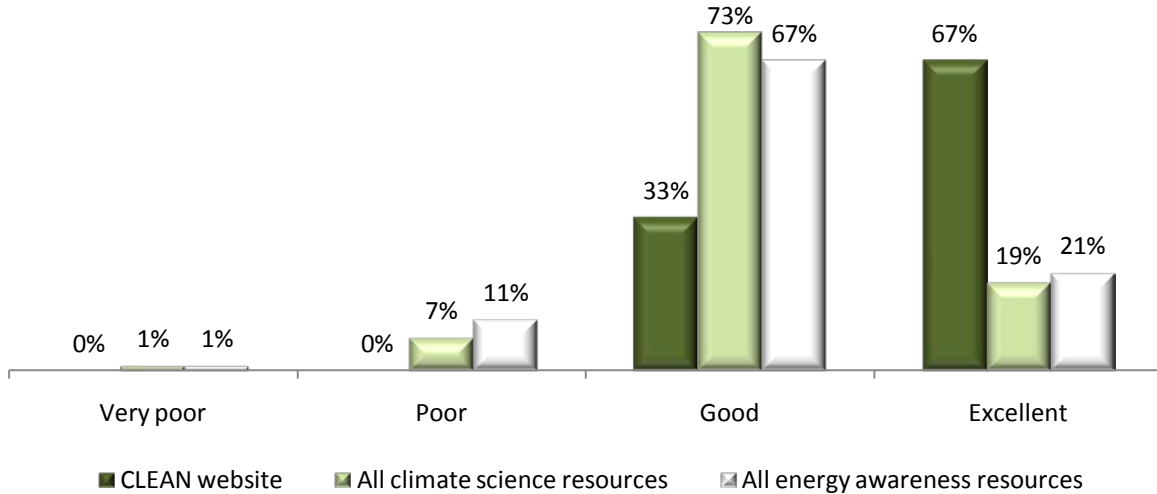
Perceived Quality, Value, and Impact of the CLEAN Collection and Supports

Quality and value of the CLEAN collection and website overall

Educators find the CLEAN collection and website to be of good to excellent quality and of considerable to great value to them as a teaching resource. The extent to which educators care about the issues on a personal level and the extent to which the site supports the improvement of their instruction both contribute to high ratings.

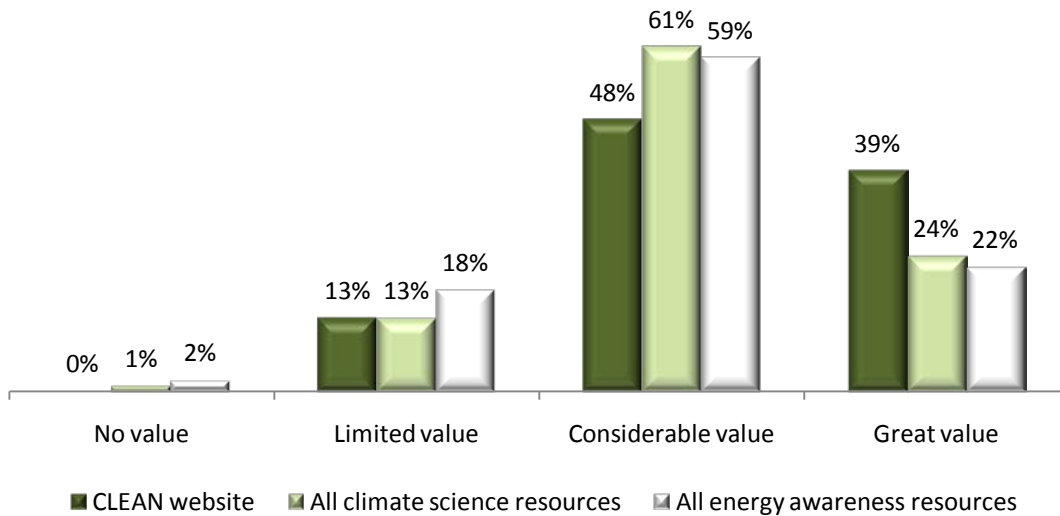
- Informants and field experts (100%) reported that the site and its contents are of **good to excellent quality overall**. (See graph on the following page.) These ratings increased over time as informants had more access and opportunity to use the site.
- Reasons given for positive ratings include: the use of real data, “sound” science, trustworthiness, searchability, and completeness of the collection.

2013 CLEAN website overall quality ratings compared to all resources on climate science and energy awareness



- When asked about the quality of specific sections of the site, the majority rated them as good to excellent.
- A large majority of informants (87%) believe the CLEAN website is of **considerable to great value** to them, as illustrated by the following graph.

2013 CLEAN website overall value ratings compared to all resources on climate science and energy awareness



Informants' confidence that they could find and use a resource increased after they experimented with trying to find something as part of the survey process. This again points to the benefit of encouraging potential users to try the site. Nearly all informants would recommend the site to a colleague; many had already done so.

Experts noted several reasons why CLEAN is a high-quality and valuable resource:

- Credibility and reliability of resources as a result of a rigorous review process
- Ability to sort and search by subject matter and grade level
- Ability to read reviewer comments on resources
- A platform for collaboration
- Professional development based on and supportive of the collection
- Opportunity for staff and developers to learn what is considered strong science and strong pedagogy
- Users/audiences included in the review process.

Impact of the CLEAN collection and professional development

Is CLEAN having a positive impact on teaching and student learning? Eighty-two percent of informants noted it was having a positive impact on their teaching to at least some extent. This positive impact was attributed to the following:

- Resources help keep them informed of the facts and issues.
- Resources help increase the amount of hands-on activity they do with their students.
- Resources are trustworthy.
- CLEAN saves them time in terms of searching for new teaching ideas.

Educators at all levels mostly believe that their instruction is impacting student concern about climate change, energy sources and uses.

Is CLEAN having an impact on educator knowledge/beliefs? Most informants' knowledge and/or beliefs remained stable over time. However, over two years, 55% of middle school teachers say their opinions have changed. Comments about how their opinions changed, and sources of information that contributed to change include the CLEAN collection, although much of the change was attributed to personal experience, for example, witnessing changing weather patterns.

Looking at the impact of the professional development that CLEAN facilitated, both the program for college instructors (workshops) and the program for secondary teachers (webinars) were very successful as strategies for introducing the CLEAN collection and increasing teachers' knowledge of climate science. Internal evaluation reports provide details about the impact of these programs. In particular, participants felt quite positive about the expert speakers, the opportunity to explore the CLEAN collection, and the overall design of the programs.

Impact of the CLEAN community

As the Climate Literacy Network and CLEAN merged into one effort, and the network reached out to the climate and energy education communities, the greater network became a significant strength of the project. The work of the project—the review camps and professional development in particular—successfully brought people together, where even more interest was created and continues to grow.

Additional details about the impact of the CLEAN community:

- Informants expressed a strong interest in a climate education professional community (9 in 10 are interested in participating in the CLEAN community).
- Currently there are over 400 subscribers to the CLEAN listserv, and an average of 20+ people attend the weekly teleconference.
- CLEAN brought together educators, scientists, and developers from across contexts to participate in the review process, which has catalyzed new collaborative relationships.
- Professional development efforts helped build community and connection among people in the field in various roles.
- CLEAN has impacted the broader science education community through outreach efforts (professional meetings, national policy input).
- The educator informant group represents a potentially important source of new members for the growing CLEAN community.

See the full report for more details on the quality, value and impact of the CLEAN collection and other project activities.

The National Landscape of Climate and Energy Education

The CLEAN educator informant group affords us the opportunity to study the ways in which educators across the country are thinking about and practicing climate and energy education. They represent, we believe, a good national sample of educators engaged in and committed to climate and energy education. In this section we describe what we have learned from them about the national educational landscape of climate and energy education. (See the full report for more details.)

Knowledge and beliefs of our informant sample

Climate and energy issues are of great importance to informants on a personal level, and they are committed to improving the state of climate and energy education. Informants are generally very well informed about key facts of climate science, and their knowledge generally tracks as even better informed than America's "alarmed" group as defined by Global Warming's Six Americas.³ For example, 93% of the informants agree with the statement that "Recent climate change is happening mostly because of human activities," compared to 87% of Six America's "alarmed" group. Similarly, 85% correctly identified "exponential increase" as the graph line that best represents how the amount of carbon dioxide in the atmosphere has changed over the past 500 years, compared to 62% of the "alarmed" public. Based on their responses, middle school informants are slightly less well informed.

Courses and topics

Courses and topics taught at each grade level focus on the general science of climate and energy and human impacts and causes. These courses take many forms, with different emphases and priorities, but instructors most often integrate climate or energy into existing courses—they are very rarely taught as stand-alone courses. Instructors address the human impacts/societal implications of energy use more than climate. See the chart on the following page for details about climate and energy topics taught by informants.

³ <http://environment.yale.edu/climate-communication/>

**Percentage of informants who taught climate science
and energy awareness topics in 2013 (N = 112)**

	Middle school	High school	Lower division university	Upper division university
Human impacts on the environment	79%	92%	75%	89%
General climate science	88%	83%	78%	83%
General energy awareness	73%	81%	75%	72%
Climate change	77%	74%	78%	78%
Human-caused climate change	65%	77%	88%	78%
Alternative energy	73%	75%	72%	72%
Energy conservation	85%	74%	66%	44%
Sustainability	52%	74%	56%	44%
Solutions to climate change	58%	63%	63%	56%
Regional impacts of climate change	56%	60%	66%	67%
Careers related to climate science and energy awareness	42%	54%	25%	28%
Other content areas taught in last three years	2%	1%	16%	11%

- The majority of informants spend less than 25% of their total teaching time on climate and energy topics—more time on climate than energy, and even more on climate at the post-secondary level. They include it for a variety of reasons, including AP requirements, standards, personal beliefs, and the fact that climate is a good subject for teaching critical thinking and other skills.
- There is more of a focus on human impacts/societal dimensions with energy than with climate, and an equal focus on both science and societal impacts with climate. Energy topics are more often integrated with other topics (especially post-secondary), with climate taught equally as a stand-alone topic and integrated with other topics.

Instructional modes

Informants employ a mix of strategies to teach climate and energy topics, strategies that are reflective of most other subjects taught in classrooms.

- Top instructional modes at all levels include discussion, hands-on activities, and lecture (lecture most often at the lower division university level). See the chart on the following page for details about instructional modes used by informants.

Instructional modes used to teach climate and energy topics

	Middle school	High school	Lower division university	Upper division university
Discussion	89%	84%	87%	94%
Hands-on activities	89%	82%	70%	71%
Lecture	52%	78%	97%	71%
Lab	39%	55%	50%	53%
Student research	48%	46%	53%	59%
Field work	24%	22%	23%	12%
Other instructional approaches	11%	15%	23%	12%

Challenges and barriers to teaching climate and energy

A majority of educators face one or more challenges in teaching climate and energy well.

- Almost half said their biggest challenges to teaching about climate are student beliefs, misconceptions, preconceived ideas, and political and religious views; one-third said curriculum, instruction, and time are challenges; one-fourth noted a lack of resources, textbooks, and activities.
- Barriers that caused them to change their teaching in some way include knowledge/understanding of public, student and parent beliefs, lack of resources, and conflicting messages in the mass media (mostly post-secondary).
- Nearly two-thirds modified their teaching due to at least one barrier; 45% of HS teachers reported experiencing no barriers.
- Fewer informants experience barriers related to energy education, which may be due to its history as a topic within most physical, earth, and environmental science courses and programs.

Successes in teaching climate and energy

Most instructors feel relatively successful in their climate and/or energy teaching, particularly with respect to their ability to integrate climate and energy topics into their classes, as well as their beliefs about increased student engagement and the extent to which students are better informed and making more connections among climate and/or energy topics and ideas.

- Over 50% reported some successes with their students; they believe students are more engaged, better informed, and making connections between and among climate science concepts. However, in comments and interviews, this was noted as an area they would like to improve upon.

- A quarter of those who commented reported success through integrating climate and energy into existing curriculum (e.g., including it in a physical science class), and finding good resources to do that.
- Other successes include examples such as having “civil discussions with parents who believe climate science is a hoax,” winning a grant, and students making a presentation to the school board about how the district could achieve \$50K in energy savings

Resources for teaching climate and energy

Instructors believe there are good quality resources available, but there is room for improvement. Informants’ perspectives on finding, choosing, and using resources include:

- Resources are available to very available (84%).
- Quality of resources is good to excellent (92%).
- Top considerations when choosing a resource include quality of the science, real-world applicability, opportunity for real data use and hands-on activity, cost, and alignment with standards.
- Resources are most often found through Google searches, while attending conferences and workshops, and through reading about current events.
- Trusted sources: among the top are NOAA, NASA, GLOBE, and SERC for climate; DOE, EIA, and USGS for energy, although there are no clear patterns of trusted sources for energy.
- The most frequently used types of resources include individual activities and videos.
- Resources are modified at least to some extent by most informants.
- There is a need for better and more resources for use in professional development settings.

Contextual supports for teaching climate and energy

- Nearly all informants feel supported by their school, colleagues, and administrators.
- The majority participate in professional communities related to climate science and energy.
- Personal learning about climate and/or energy occurs via a mix of formal and informal opportunities. There is professional development available, but a substantial minority says it is not very available, and even less so for energy.
- Most have had some professional development, primarily at workshops or conferences; one in four has participated in online professional development.
- They rated the quality of their professional development as good or excellent: 91% gave these ratings to professional development in climate science and 88% to professional development in energy awareness. The value of the professional development was rated slightly lower: 81% said climate science professional development was of considerable to great value; 71% gave similar ratings to professional development around energy awareness.

Bottom line: the field of climate and energy education is currently relatively stable

We asked the same questions about a number of contextual factors at the beginning of our study and again on our final survey. Informants reported that supports for teaching (i.e., institutional support for teaching climate and energy, the informant group's learning opportunities, availability of resources about and for teaching these two topics) remained relatively stable and unchanged over the duration of our study. We did see some shifts in specific topics taught over the two years that did not seem to follow any pattern and were not major. However, there was some change in instructional approaches, especially at the middle school level, and especially in teaching about the climate.

The largest change we saw over the two years was the dramatic increase in usage and valuing of the CLEAN website, which we have reported above.

Broader Implications and Recommendations

Implications for the Field of Climate and Energy Education

- Climate science and energy awareness are becoming **increasingly important topics** for teachers to attend to (i.e., Next Generation Science Standards). **CLEAN provides a trustworthy source** of guidelines and resources for teaching about climate and energy.
- Educators said there were adequate resources and they felt adequately informed and confident prior to their use of the CLEAN website, but they perceived that **there was room for improvement in the quality of the resources available to them**. After using **the CLEAN website**, they overwhelmingly recognized that its carefully **vettted and organized resources were of higher quality and value than resources about climate and energy education in general**.
- The **CLEAN review criteria and review process** are a strong contribution to the field, specifically to **assist future resource developers** as they create new resources for teaching climate and energy or refine existing ones.
- The **rate of change in instructional approaches (in terms of trying new strategies, resources, etc.) is slow, but greatest at the lower grades, especially middle school**. This has implications for future resource development as well as outreach to these teachers to encourage them to try CLEAN.
- Barriers to teaching about climate science and energy awareness stem from a **general lack of understanding about the issues by the public, and student/parent skepticism** about the role of human activity in climate change. This suggests there is a role for the CLEAN community in addressing climate literacy on a larger scale, particularly considering the media's influence on public understanding of climate. That is, CLEAN could play a role in communication with audiences outside of formal education.
- One of the toughest challenges teachers face is to **positively affect student engagement with the topics and enable them to make connections between concepts in climate science**. How can the field better support teachers in this area?
- With ongoing leadership and guidance, the growing **international CLEAN professional community has strong potential to positively impact** the improvement of climate and energy education.
- The use of an **educator informant group is a useful strategy** for monitoring and providing input and feedback when developing a resource such as CLEAN. Understanding user needs and contexts can help increase the value of the resources.

Implications for CLEAN

- The familiarity of half of the informant group with Climate Literacy Essential Principles in 2011, their participation in professional and other groups around climate change and energy, and their many comments over the years that indicate a strong commitment to improving climate literacy are among the findings that suggest that most are advocates, and that their personal motivation and confidence is driving inclusion of these topics. **The CLEAN collection could thus serve to empower instructors to engineer usage and inclusion of these resources in a wide range of settings.** For users to draw upon the large collection for the broadest purposes, resources must be carefully labeled, described, and “filed.”
- As we have learned in other curriculum-based studies, **educators using the CLEAN website tend to modify resources they find there.** This has implications for the way resources are presented. For example, should resources be downloadable in relatively small pieces? Are there some resources that CLEAN experts believe should be used as designed, and if so should they be specially designated? Should the CLEAN website include a section for people to describe their usage and modification of the resources?
- The success of the online professional development efforts of CLEAN, and the finding from the informant surveys that teachers increase their use of the collection once they are introduced to it, suggests that **ongoing outreach efforts by CLEAN to introduce and orient educators to the website would support more use in the field.**
- The strategy of having **both climate and energy together** seems to be a savvy choice, as most of our informants appear to be teaching both topics.
- It appears the **need for CLEAN**—and openness to new information and high-quality, usable resources—**is highest at the middle school level**, more than high school or post-secondary.
- It is clear that most **educators want to focus on both the problems and the solutions vis-à-vis the climate.** There is a question of how much CLEAN wants to take on the more sophisticated socio-political context and debate that shape solutions.
- The fact that most of our **informants learn about climate science and energy awareness through a mix of formal and informal opportunities, with an emphasis on the informal**, suggests that the collection should include options that could be used in a personal or informal setting.
- Informants have a large number of professional and collegial links and considerable expertise (e.g., participation in professional groups), which supports our observation that this is an engaged group in relation to the issues of climate science and energy awareness. Thus, this informant pool should not be seen only as consumers of the CLEAN collection; rather, the capacity and commitment of this group begs the question of **how CLEAN can best utilize the knowledge and experience of practitioners to help publicize and improve the collection and the website further, even on an ongoing basis.**

Implications for Future Funding

Funders should find ways to support the development of communities of leading educators in a field if they wish to support that field more broadly. The passion and commitment of the educators in our informant group represent a latent asset that can be harnessed and put to use in promoting improvement across the field. Leading teachers, like leading surgeons or musicians, are those people who are simultaneously committed to improving their own practice and furthering the improvement of the collective profession. Such groups of leading professionals have recently been called Networked Improvement Communities (NIC).⁴ The CLEAN community represents a latent NIC that makes the improvement of climate and energy education an investable proposition for foundations and agencies interested in doing so.

CLEAN demonstrates the power of connecting a resource collection, a national network, and professional development. Each supports the other, creating a synergy that results from doing all three in conjunction. Resources not only serve as curricular materials but also provide a focal point for the community; professional development (providers and participants) helps people learn more about climate science and heightens their familiarity with the resource collection; and a networked community is a national resource that both contributes to and draws from its members. Funding strategies that support all these elements are more likely to build a lasting, robust climate and energy education landscape.

⁴ www.carnegiefoundation.org/elibrary/getting-ideas-action-building-networked-improvement-communities-in-education