



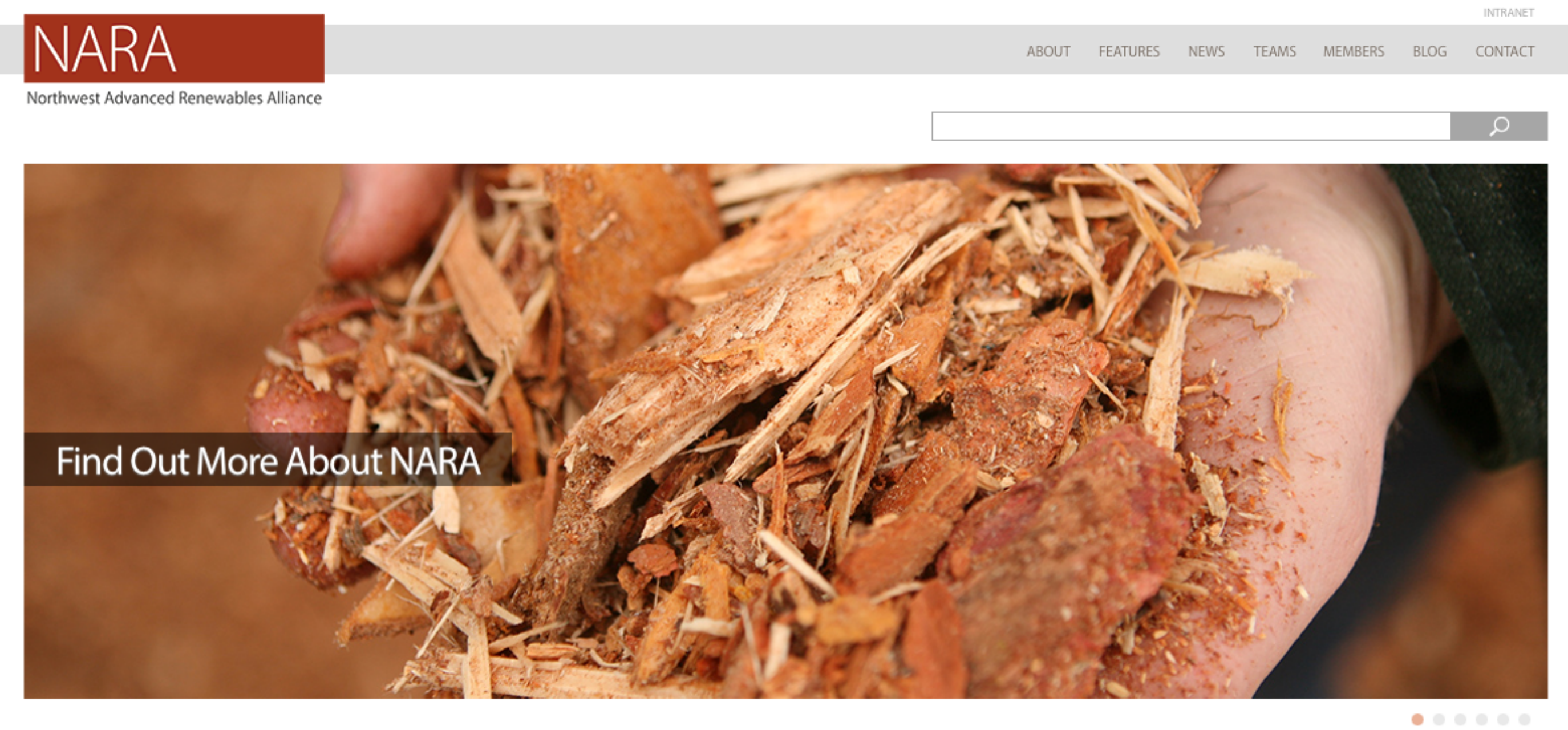
Education at the Speed of Research: An Overview of the NARA Approach to BioEnergy Literacy

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INTRODUCTION

Developing environmentally and economically sustainable alternatives to petroleum is a central challenge of the 21st century. Aviation requires energy-dense liquid fuels, currently derived exclusively from petroleum. This fossil energy dependence poses tremendous challenges to carbon emissions reductions. In the Pacific Northwest, considerable research is focused on developing viable biofuel alternatives from existing waste streams like forest harvest residues and municipal solid waste. We will discuss the proposition that significant positive environmental and economic benefits can be achieved, including lower carbon emissions, improved air/water quality, and the development of a regional sustainable energy and co-product industries. This content populates an energy literacy infrastructure that reaches educational stakeholders across disciplines and audiences.



WOOD TO WING

NARA WORKS TO HARNESS WOODY BIOMASS FOR AVIATION BIOFUEL

Featuring a broad alliance of private industry and educational institutions, the Northwest Advanced Renewables Alliance (NARA) takes a holistic approach to building a supply chain based on using forest residuals to make aviation biofuel. The alliance is tasked with increasing efficiency for each supply chain step from forestry operations to conversion processes; creating new bio-based products; providing economic, environmental and social sustainability analyses; engaging stakeholder groups; and improving bioenergy literacy for students, educators, professionals and the general public.

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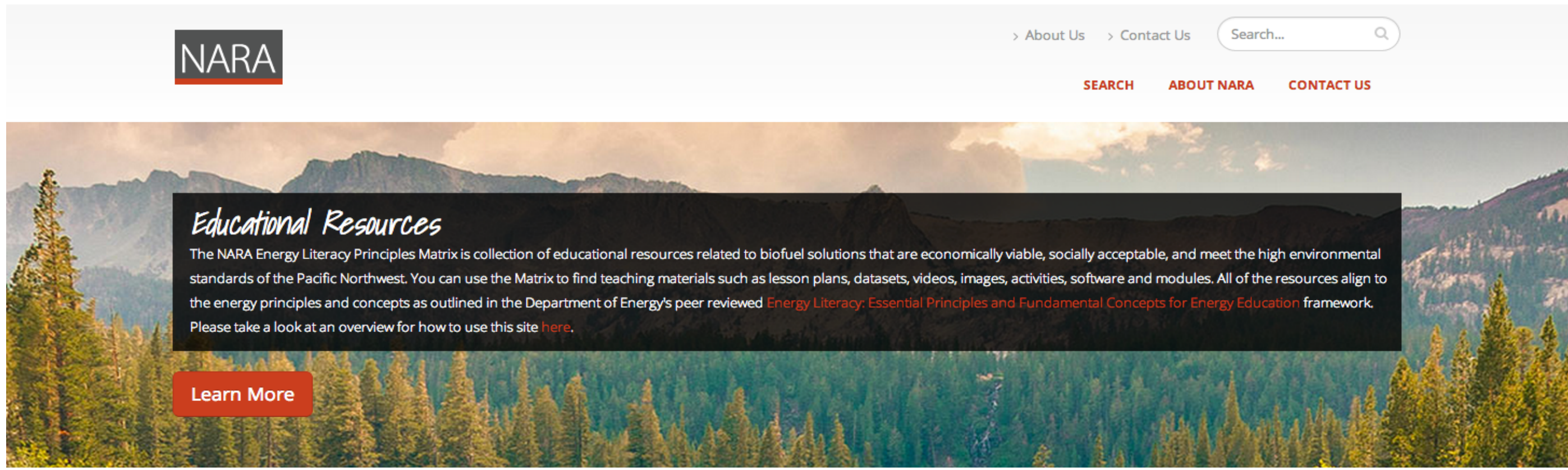
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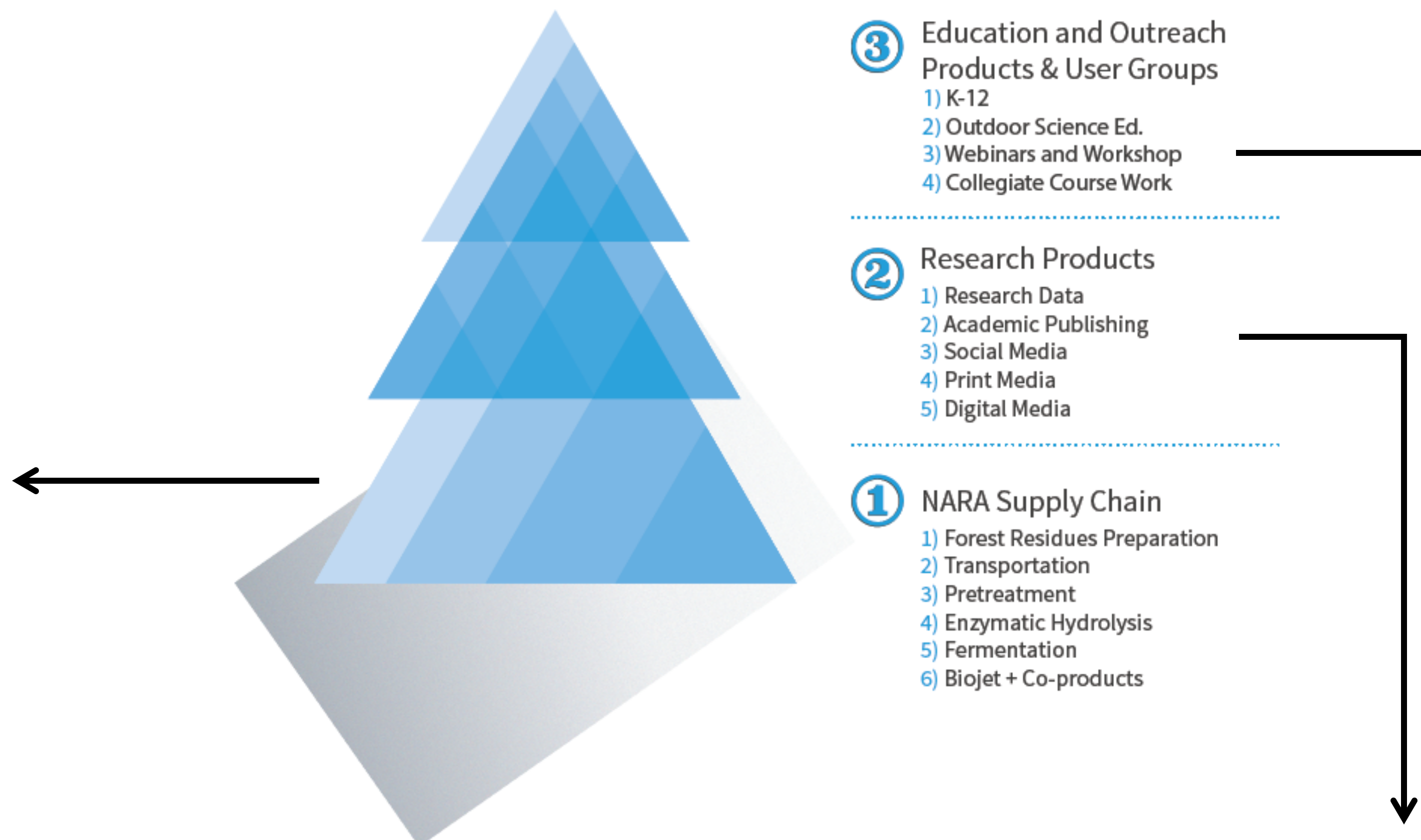
NARA's five teams: To meet its mission's goals, the Northwest Advanced Renewables Alliance is broken down into five main areas of focus: education, sustainability measurement, feedstocks, conversion, and outreach

ADDRESSING ENERGY LITERACY

Energy Literacy is a foundational component of education for sustainability and for greening the curriculum. Integrated approaches in the sciences—including energy literacy—must be developed to cross disciplines effectively, include all stakeholders and situate environmental sciences into the consciousness of learners of all ages. Meaningful approaches to this challenge addresses formal and continuing education settings and engages K through graduate students alongside educators. Studies have found that communicating research of the natural world enriched the students' understanding of our dynamic planet. NARA Education is addressing many entry points into the education system, while supporting the collection of materials suitable for education. WWW.EnergyLiteracyPrinciples.org provides the infrastructure for education at the speed of research. Students and educators need not wait for research results to trickle down through publications and eventually into textbooks, they can instead engage as meaningful partners along the path that all research takes.



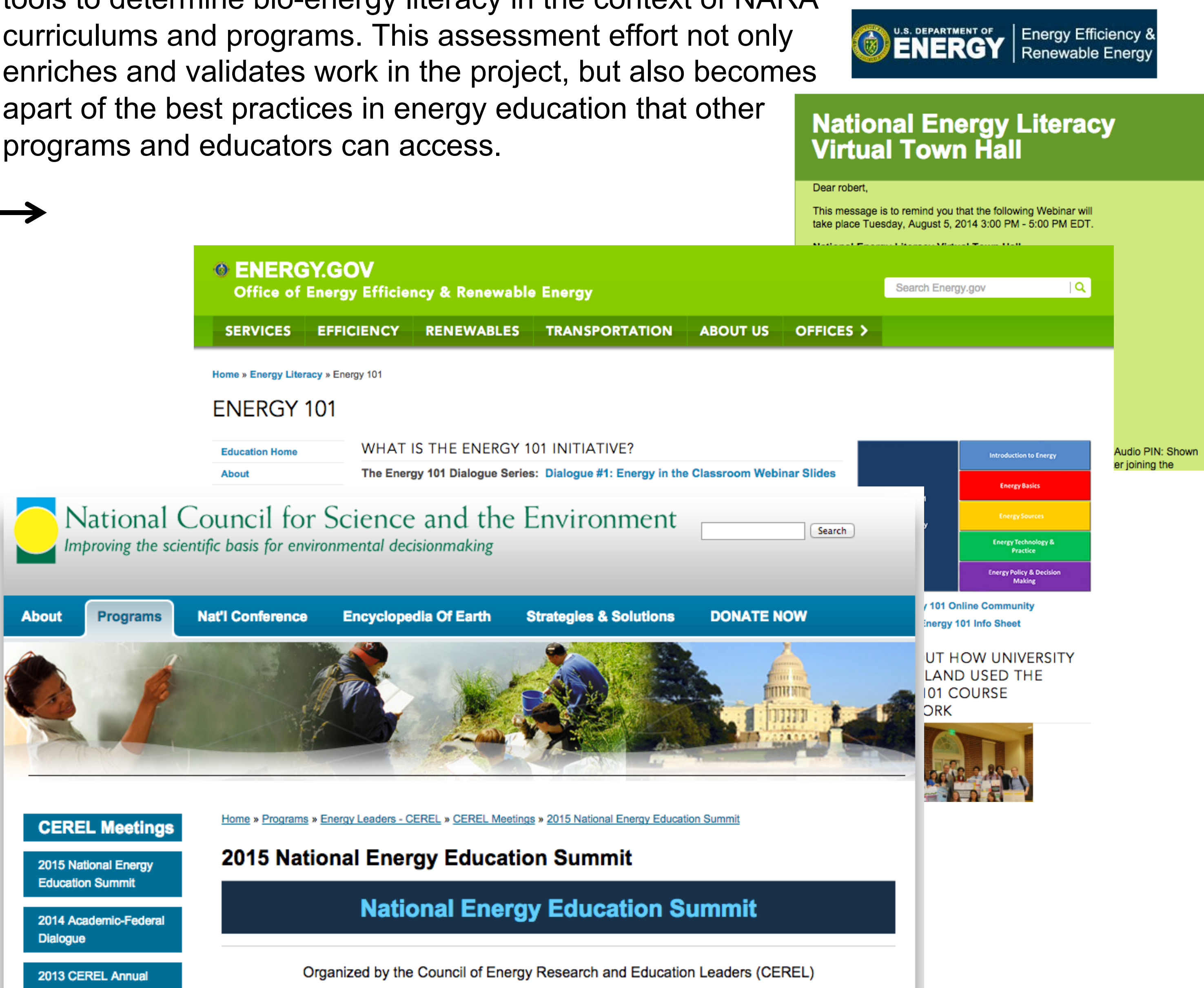
Education and Outreach Connections



NATIONAL LANDSCAPE OF ENERGY EDUCATION

An emerging and evolving discourse around energy education theory, practice and research is strengthening nationally. NARA Education team members have been engaged in the U.S. Department of Energy's efforts, including webinars, a virtual town hall, and in the Energy Education Summit hosted by the National Council for Science and the Environment as well as the Midwest Renewable Energy Association's summit. This work is broadening access to energy education and enhancing research dialogues. Additionally, the Journal for Sustainability Education is soliciting articles for a focused Energy Education issue to which NARA team members have contributed.

The NARA Education team has developed assessment tools to determine bio-energy literacy in the context of NARA curriculums and programs. This assessment effort not only enriches and validates work in the project, but also becomes apart of the best practices in energy education that other programs and educators can access.



IMPLICATIONS FOR ENERGY EDUCATION AND STEM

Exciting discoveries and research are occurring everyday at universities and by research partners all over the world. Having teaching and education move at the same relative pace is vital to college and career readiness that prepare students to be responsible citizens, as well members of a global or local community and workforce. Energy literacies and STEM education are important to students everywhere for active participation in the economies of tomorrow. It is increasingly imperative that they have the skills and literacies in science, technology, engineering and math to make good decisions, new discoveries and to enrich quality of life for themselves as well as those around them.

Further information: info@nararenewables.org and www.nararenewables.org
Graphics and Layout: Jacob Smith (WSU-NARA) and Kevin O'Brien (University of Wisconsin-Extension)

NARA

Northwest Advanced Renewables Alliance

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