



NARA

# Project Facilitation

## NARA Final Meeting, November 17, 2016

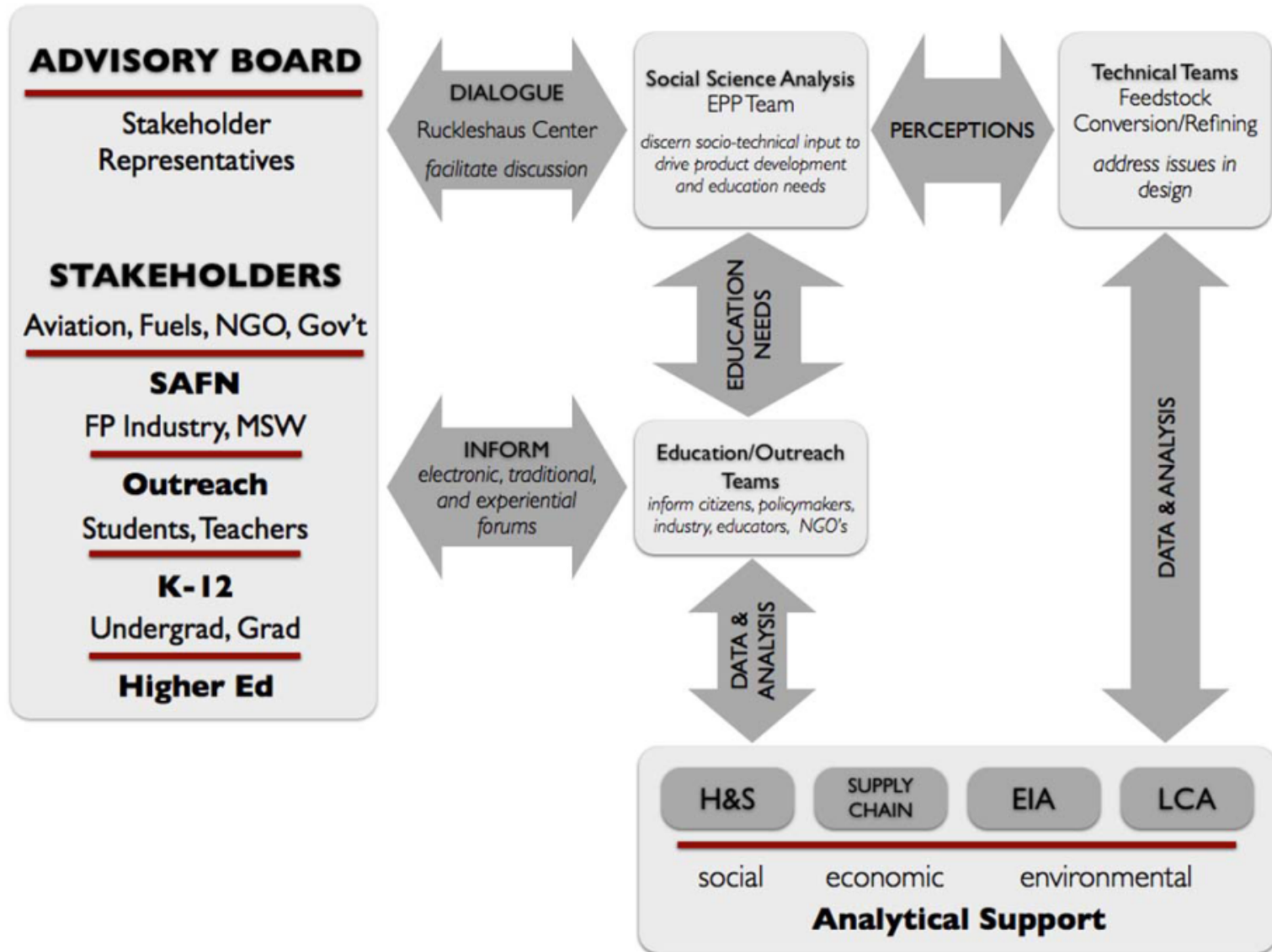
Michael Kern, William D. Ruckelshaus Center

- ***Mission:*** help parties involved in complex public policy challenges in State of Washington and Pacific Northwest tap university expertise to develop collaborative, durable, effective solutions.
- Center envisions a future in which government leaders, policy makers, and citizens routinely employ tools of collaborative decision making to design, conduct, and implement successful public policy processes.



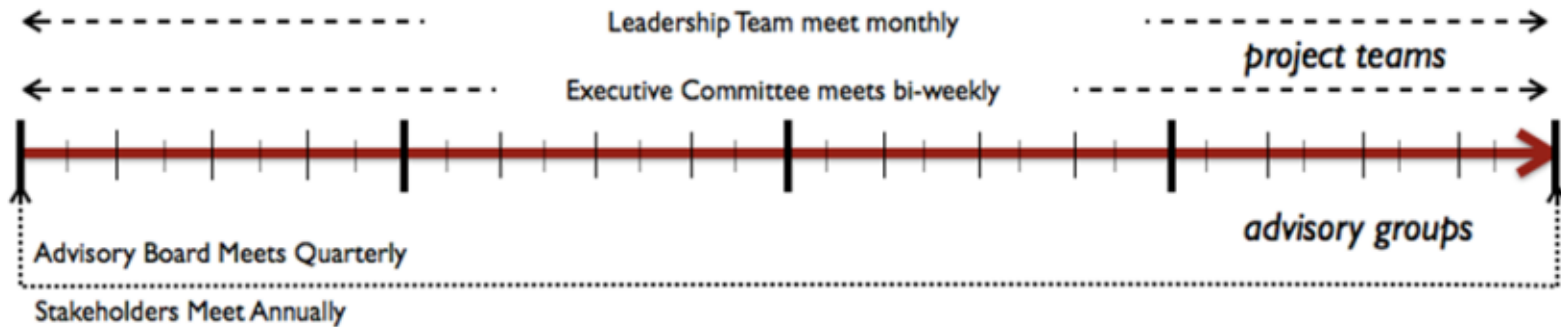
THE  
WILLIAM D.  
RUCKELSHAUS  
CENTER

# Process Diagram



# Annual Meeting Cycle

**Project Redirection**  
*Annual project assessments will guide redirection of tasks and goals. Funds may be reallocated depending on project need and performance.*



*William D. Ruckelshaus Center will facilitate key meetings and perform an interviewed-based assessment. The EPP group will analyze key data to produce actionable items to guide the project teams.*

# Policy Maker Briefings

**NARA**

Northwest Advanced Renewables Alliance

## TAKING WOOD TO NEW HEIGHTS

Led by Washington State University and funded by Agriculture, the Northwest Advanced Renewables Alliance is a sustainable industry in the Pacific Northwest that uses biofuel and reliable co-products. The alliance includes private industry and interested stakeholders and is:

- Sustainable work based from woody biomass
- Value-added polymer and carbon production
- Regional supply chain coalition
- Rural economic development
- Diverse energy

## NARA FUNDING

- 40 states:** Budget offices need state solutions for people interested in better ways to look into the need
- 10 states:** Major wood products and forest products and forest wood products are being the same and forest wood products are being the same
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USDA NIFA 2014-2018 Strategic Plan

nararenewables.org

# WOODY BIOFUELS INITIATIVE IN THE PACIFIC

As part of a national effort, the USDA National Institute of Food and Agriculture (NIFA) in 2011 to develop a sustainable wood to biofuels industry organization — NARA (Northwest Advanced Renewables Alliance) both as a collaboration between universities, government and in

## PURPOSE

- To develop a foundation for a biofuel industry based on woody feedstocks
- To provide a drop-in infrastructure compatible fuel to meet the renewable fuel standard
- To ensure the industry is environmentally and economically sustainable
- To promote biofuels life cycle and help prepare as emerging work force
- To involve extensive outreach and build community coalitions with empowered stakeholders

Northwest Advanced Renewables Alliance

**nararenewables.org** **NARA**

**PRIMARY FEEDSTOCK**  
Softwood - Forest Harvest Residuals

**LEAD INSTITUTION**  
Washington State University

**PRODUCTS**  
Jet Fuel and Lignin Based Co-products

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USDA NIFA 2014-2018 Strategic Plan

**NARA**

Northwest Advanced Renewables Alliance

## KEY ACCOMPLISHMENTS TO DATE: JULY 2013

We are advancing the development of renewable energy from forest byproducts such as slash piles and construction waste.

- Converting wood residues from several Northwest tree species into a drop-in fuel to produce aviation fuel at 50% cost efficiency.
- Douglas-fir trees can be selected in a manner that will enhance their growth and contribute to production of biofuel.
- We developed models that help regional and local decision makers navigate logistical hurdles in processing and transporting.

We are helping mitigate biofuel production costs by exploration of value-added co-products.

- The process of turning woody biomass into biojet fuel generates lignin-rich by-product. Promising research shows that the lignin can be converted into commercially viable products such as carbon, concrete dispensants, and thermoplastics.

Our work enhances and sustains rural economic development of a biofuel co-product processing infrastructure will benefit communities in the Pacific Northwest that are ready to retrofit plants and utilize existing assets for economic growth.

- Successful processing centers have been identified, and a depot model in rural communities has been completed in western Montana Corridor (WMC) that includes counties in western ID and northern WA.
- Effective, well-coordinated supply chains are critical for a renewable energy industry to be sustainable. We completed a supply chain analysis for the WMC, and are now focusing on western Oregon and Washington.
- When surveyed, over 150% of stakeholders in the WMC wood local community and forest health.

Producing biofuels also means cleaner, healthier environments.

- A preliminary analysis indicates that use of biojet fuel from forest residues produces significantly less CO<sub>2</sub> and ozone emissions than jet fuel emissions.
- Other natural benefits such as long-term soil productivity, water effects, and wildlife impacts are being assessed.

By improving bioenergy literacy, we are helping develop a workforce, providing professional development, and enhancing understanding.

- With NARA training, 812 teachers improved bioenergy literacy.
- NARA sponsors a regional high school competition, "Imagine" which is expanded to all NARA states (OR, WA, ID, MT) and includes biofuel category (<http://imagine.wsu.edu>).
- NARA offers many undergraduate and graduate research and biofuel curriculum for middle and high school students.

USDA NIFA 2014-2018 Strategic Plan

Led by Washington State University and funded by the USDA National Institute of Food and Agriculture, the Northwest Advanced Renewables Alliance (NARA) is helping to develop a sustainable industry in the Pacific Northwest that uses forest residues and waste from construction and demolition to make biofuel and valuable co-products. The alliance, formed in August 2011, includes public universities, governmental agencies, private industry and interested stakeholders.

## Northwest Advanced Renewables Alliance

**Creating Lasting Impact For Our Future**

Informed citizens are needed. Below are some of NARA's outreach efforts toward creating a sustainable future on the coming energy transition.



1/3 of the \$40 million total NARA project funding is designated for education and outreach purposes.



## NARA's Investment in Biofuel Education

One of NARA's goals is to promote bioenergy literacy among students, professionals and the general public. This action is intended to develop a future bioenergy workforce and informed citizens. Listed are programs that receive financial support from the USDA-NIFA through NARA.

### McCall Outdoor Science School

MOSS is a 12-16 outdoor school teaching field arts, science, place and community. NARA's support helped Pacific Northwest teachers and graduate students include biofuels lessons into the classroom.

Result: Over 200 teachers and 20 graduate students participated in a bioenergy workshop and 20 lessons plans developed. More than 12,000 students participated in energy literacy lessons through MOSS.

Learn more at <http://www.nararenewables.org/files/mcalloutdoor-science-school>

### Energy Literacy Principles Matrix

The "Matrix" is an online resource that provides educational materials to teachers and students related to biofuel literacy. All resources are aligned with STEM standards.

Result: Over 700 resources have been cataloged.

Learn more at <http://www.nararenewables.org/files/energy-literacy-principles-matrix>

### Tribal Partnership Program

TPP provides research opportunities in the area of biofuel development to Native American college students.

Result: Of the 35 Native American scholars who have participated in the NARA TPP program, one Associate in Applied Science (AAS) degree, five Bachelor of Science degrees, and one doctorate degree has been awarded. In addition, 10 Native American are on tap to achieve the degree in the academic year.

Learn more at <http://www.nararenewables.org/files/tribal-partnership-program>

### Facing the Future

FTF creates interdisciplinary K-12 curriculum that equips and motivates students to develop critical thinking skills, build global awareness, and engage in possible solutions for sustainable future. NARA supported the development of elementary, middle, and high school energy curriculum and accompanying teacher training.

Result: Over 425 copies of Facing Our Future: 25 elementary, 222 middle, and 170 high school have been distributed to teachers and 272 free individual lessons (middle school and high school) have been downloaded from FTF website, reaching over 20,000 students.

Learn more at <http://www.facingthefuture.org/>

### Imagine Tomorrow

Pacific Northwest high school students provide creative solutions to the world's energy needs at the annual Imagine Tomorrow competition. NARA's support expanded the event to Oregon, Idaho and Montana students and instigated a biofuel challenge category.

Result: Sixty-nine teams (over 150 high school students) have developed projects that explore the development of biofuel.

Learn more at <http://www.nararenewables.org/files/imagine-tomorrow>

### Summer Undergraduate Research Experience

College undergraduate students conduct research during the summer.

Result: NARA included six undergraduate students in project research ranging from power technology to biofuel analysis.

Learn more at <http://www.nararenewables.org/files/summer-undergraduate-research-experience>

### Integrated Design Experience

IDX is a course that helps students integrate bioenergy into undergraduate and graduate students that use real-world projects to train students to participate in a sustainable future. NARA's support designed students to develop a facility for a bioenergy process and design that to contribute to energy production that can be used to meet needs to produce a better future energy product.

Result: Over 185 students (110 undergraduate, 60 graduate, and 15 Ph.D.) from Washington State University and University of Idaho have participated in IDX NARA and MESA Teacher projects, and 10 are entering the bioenergy workforce.

Learn more at <http://www.nararenewables.org/files/integrated-design-experience>

### FOR FURTHER INFORMATION CONTACT:

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