



Sam Houston State University  
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# Agricultural Sustainable Energy Education Network Teacher Professional Development Summer Workshop



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Sam Houston State University in partnership with the Vocational Agriculture Teachers Association of Texas and Houston Community College  
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## Abstract

- ASEEN is a three year project managed by the Sam Houston State University Department of Agricultural Sciences and Engineering Technology to promote sustainable energy education in K-12 rural schools in Texas, with a focus on Ag applications
- Workshops are conducted with high school students in the school year to reinforce STEM concepts and educate students about careers in sustainable energy
- A renewable energy curriculum has been developed for Texas high school teachers and interested audiences:  
<http://www.shsu.edu/centers/aseen/modules.html>
- The third teacher professional development summer workshop took place June 8, 2015 with 21 high school AFNR and Science teachers
- The pre and post workshop understanding of sustainable energy concepts by participants is reported

## Requirements for Participation

AFNR and Science teachers:

1. Must both participate in the 5 day professional development program on the SHSU campus
2. Must currently work in a 1A, 2A, 3A, 4A school district with a largely rural population
3. Should preferentially have between 3 and 15 years of teaching experience in Texas high schools, although other candidates are considered
4. Must commit to teaching across curriculum units, lecture on agricultural sustainable energy, energy safety and conservation, and promote STEM education
5. Must commit to completing a school-wide energy audit with student involvement

## Partners



## Surveys

Pre and Post Workshop Mean Understanding Ratings

		N	Mean	Std. Dev.	Std. Error
Renewable Energy	Pre	21	3.10	.70	.15
	Post	21	4.43	.60	.13
Energy Conservation	Pre	21	3.00	.63	.14
	Post	21	4.38	.67	.15
Solar Energy	Pre	21	3.10	.70	.15
	Post	21	4.43	.60	.13
Wind Energy	Pre	21	3.14	.57	.13
	Post	21	4.33	.80	.17
Geothermal Energy	Pre	21	2.10	.89	.19
	Post	21	4.48	.68	.15
Biofuels	Pre	21	2.71	.96	.21
	Post	21	4.38	.80	.18
Hydropower	Pre	21	2.71	.78	.17
	Post	21	3.95	.67	.15
Energy Audit Practices	Pre	21	1.95	.86	.19
	Post	21	2.76	1.30	.28

In the area of Understanding Ratings, mean post-workshop average scores increased by 0.8 or greater over pre-workshop scores in every subject matter area. The greatest increases of understanding were in the areas of geothermal energy, energy conservation, and biofuels.

General Workshop Outcomes Ratings

	Strongly Disagree		Disagree		Neither Agree nor Disagree		Agree		Strongly Agree		No Opinion	
	N	%	N	%	N	%	N	%	N	%	N	%
Helped me better understand the issue	1	4.8%	0	0.0%	0	0.0%	6	28.6%	14	66.7%	0	0.0%
Provided information relevant to my work	0	0.0%	1	4.8%	1	4.8%	7	33.3%	11	52.4%	1	4.8%
Were based on current, up-to-date information	1	4.8%	0	0.0%	1	4.8%	4	19.0%	15	71.4%	0	0.0%
Addressed the topic identified in the title	1	4.8%	0	0.0%	0	0.0%	3	14.3%	17	81.0%	0	0.0%
Were well organized	1	4.8%	1	4.8%	0	0.0%	7	33.3%	12	57.1%	0	0.0%
Were easy to understand	0	0.0%	1	4.8%	0	0.0%	10	47.6%	10	47.6%	0	0.0%
Will be of great use to me	1	4.8%	1	4.8%	2	9.5%	3	14.3%	14	66.7%	0	0.0%

Eighty one percent or more of the responses agreed or strongly agreed with seven positive workshop delivery outcomes. This compares favorably with 2013 and 2014.

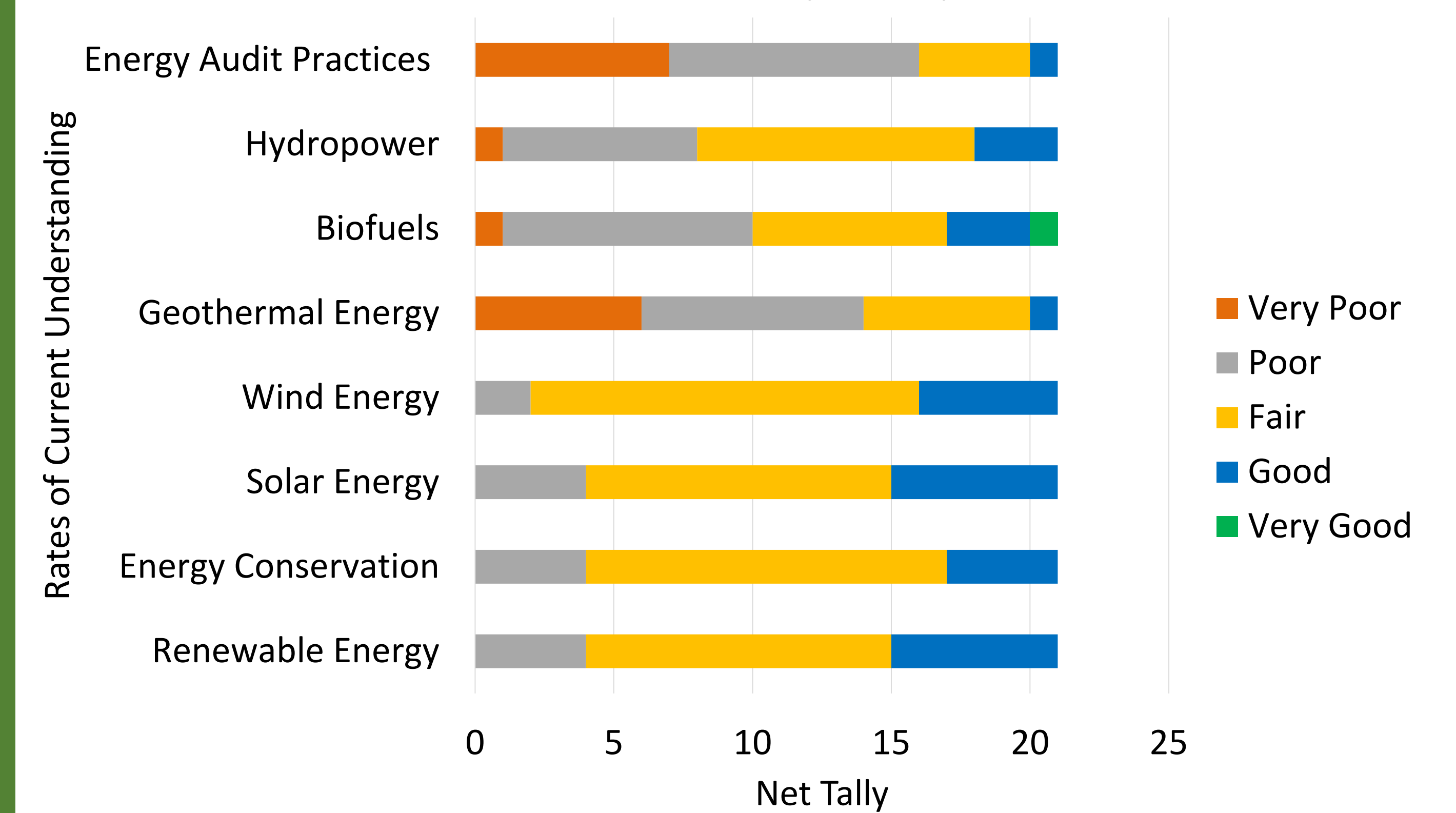
## Hands-On Activities

Teachers attended presentations from industry/academia and participated in hands-on training on: solar energy, wind power, hydro-power, biofuels, geothermal, green building design, and energy audit practices

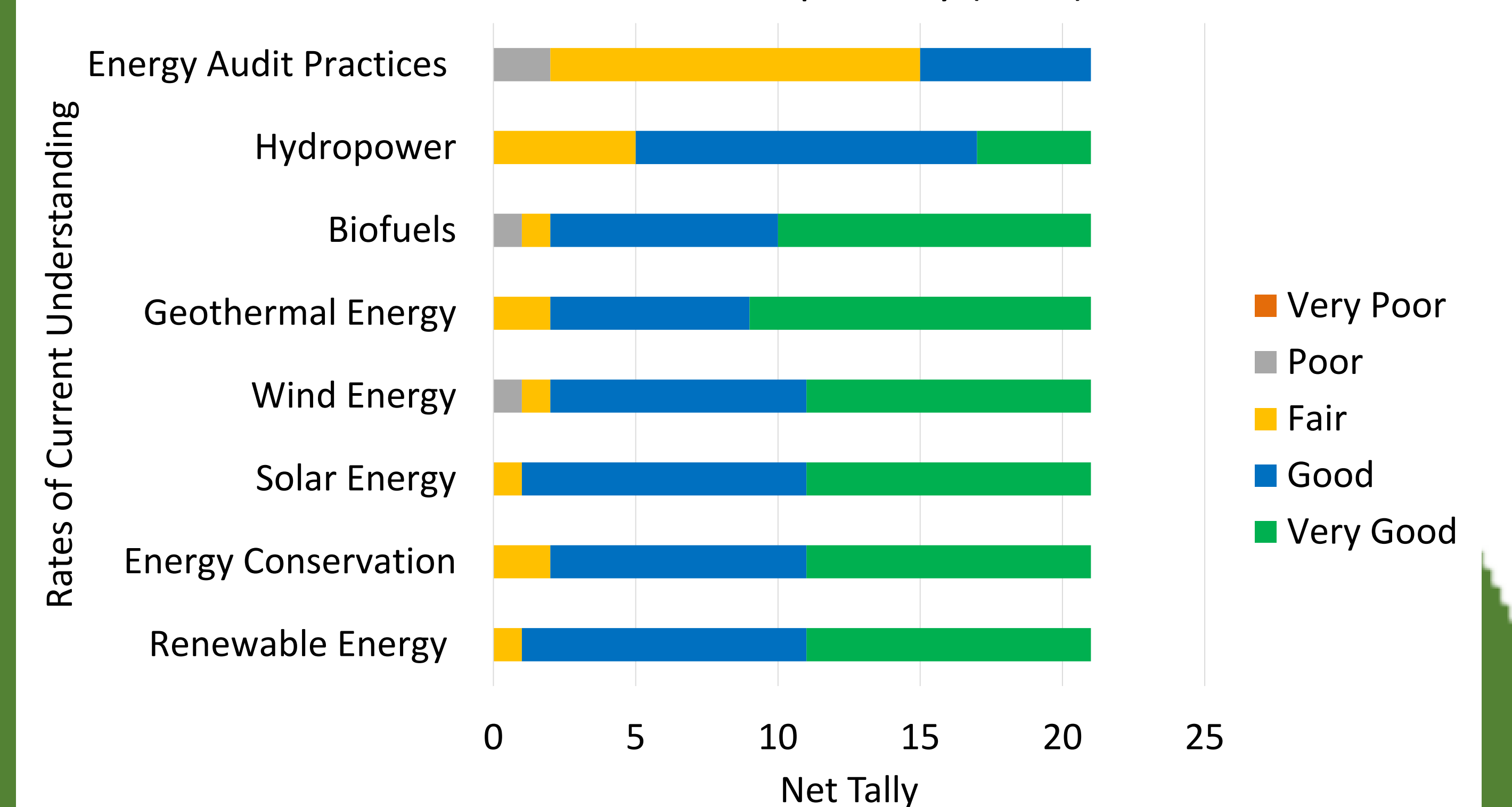


## Pre vs. Post Workshop Data

ASEEN Pre-Workshop Survey (2015)



ASEEN Post-Workshop Survey (2015)



## Conclusions

- During the five day workshop eight speakers presented topics on renewable energy. After each speaker presented, teachers were asked to complete a survey of understanding for that certain topic.
- The ASEEN project has improved knowledge of teachers, both agriculture and science, for the better.
- The answer to the question "Was the training worth your time?" received progressively more "Extremely" responses from 2013 to 2015.

	2013	2014	2015
Moderately	4.8%	5%	4.8%
Very	81%	65%	52.4%
Extremely	14.3%	30%	42.9%