Exploring Private Preference for Wood for Energy Investments

Francisco X. Aguilar[1]

Summary. This article presents and discusses findings of an exploratory marketing study of individual private investors' preferences for renewable energies. The study, completed in the summer of 2008, reports about the importance of items considered by participants when selecting an investment option, their views regarding forests services and forest management. A research design distinguished between different investment options (stocks, wood-based energy, solar/wind energy), expected returns on investment, and geographic location of investments (within state, in the U.S. and abroad) to elicit investment preferences. Results indicate that wood-based energy investments rank below stock market and solar/wind renewable energy investments. The geographic location of energy investments within the U.S. was a major factor influencing investment preferences. Attitudes toward wood-based energy investments were highly dependent on views of forestry and perceived expected returns on interest. This research suggests that a pool of potential investors could support the development of the wood-based energy sector. Interest can be linked to favorable attitudes towards forestry and minimum investment returns. A niche of potential investors can be expected if the use of woody biomass is perceived as a practice beneficial to forest health.

Keywords: *Investment Preferences, Renewable Energy, Wood-Based Energy, Ordinal Logit*

Introduction

Current high energy prices for fossil fuels have fueled interest in development and adoption of renewable energies. Oil prices have experienced a recent steep increase. On January 5 of 2007 the price of a barrel of oil (U.S. Spot FOB price) was reported at $51.57, a year later on January 4, 2008 its price had jumped to $88.41 and by July 25, 2008 it had reached $122.59 as reported by the U.S. Energy Information Administration (EIA, 2008b). High prices, and the fact that most fossil fuels come from foreign countries (58% of petroleum demanded in the US is imported – EIA 2008a) have raised concerns over national energy security. These conditions have resulted in an array of new policies adopted by the U.S. Federal Government. The 2007 Energy Independence and Security Act outlined a significant increase in the use of renewable fuels in the United States. It set a mandatory renewable fuel standard that requires fuel producers to use at least 36 billion gallons of biofuels by 2022 (Public Law 110-140).The Act also requires an increasing reliance on "advanced biofuels"[2]. Advanced biofuels utilize non-food feedstocks and can help (a) reduce the country's dependence on foreign fuels, (b) ameliorate greenhouse gases emissions, and (c) alleviate concerns about competition between energy and food (Bodman and Schafer 2008).

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[2] The term 'advanced biofuel' under Public Law 110-140 means renewable fuel, other than ethanol derived from corn starch, that has lifecycle greenhouse gas emissions that are at least 50 percent less than baseline lifecycle greenhouse gas emissions. Advanced biofuels include (1) ethanol derived from cellulose, hemicellulose, or lignin; (2) ethanol derived from sugar or starch, other than corn starch, (3) ethanol derived from waste material, including crop residue, other vegetative waste, material, animal waste, and food waste and yard waste; (4) Biomass-based diesel; (5) biogas (including landfill gas and sewage waste treatment gas) produced through the conversion of organic matter from renewable biomass; (6) butanol or other alcohols produced through the conversion of organic matter from renewable biomass; (7) other fuel derived from cellulosic biomass.

Public support coupled with high energy prices have made renewable energies more cost-competitive in the market and have improved prospects for profits. Federal and State policies, in the form of mandatory renewable energy uses and financial incentives have spurred further interest in the renewable energy sector. Policies such as the adoption of mandatory Renewable Energy Portfolios adopted by twenty-eight states in the continental U.S. by September 2008 promote the use of renewable energy feedstocks at the state level. State-level monetary incentives like the Missouri Qualified Fuel Ethanol Producer Incentive Fund also seek to attract new investments and promote development of the energy sector (Missouri Senate Bill No. 931, 2008). This Fund is targeted to any producer of fuel ethanol whose principal place of business and facility for the fermentation and distillation of fuel ethanol is located within the state of Missouri and is at least fifty-one percent owned by agricultural producers. Ethanol shall be made from cereal grains, cereal gain by-products, or qualified biomass. Qualified biomass is defined by this regulation as any wood-derived organic material harvested in accordance with a site specific forest management plan developed by a professional forester. Each Missouri qualified fuel ethanol producer is eligible for a total grant in any fiscal year equal to twenty cents per gallon for the first twelve and one-half million gallons plus five cents per gallon for the next twelve and one-half million gallons. The State of Pennsylvania has also adopted legislation to promote cellulosic ethanol production. Under House Bill 1202 all gasoline sold at retail in Pennsylvania must contain 10 percent ethanol - once in-state cellulosic ethanol production reaches 350 million gallons (Pennsylvania Governor's Office of the Budget).

The above mentioned and many other incentives aim to promote renewable energy initiatives around the country. They can attract private capital to the renewable energy business sector, thus, opening the door for new investment alternatives. The forest sector in particular can benefit from the emergence of renewable energy markets. Wood for energy initiatives have the capacity to generate energy locally, generate additional work opportunities for harvesters and loggers, provide more opportunities for commercial thinning, improve the health of forestlands, and create jobs in the energy industry.

The forest sector is in a competitive position to attract funds thanks to its existing framework for private capital investments. Steady increases in real prices for lumber over time have successfully attracted investments to the forest sector (Adams et al. 1982). Timberland Investment Management Organizations (TIMOs), and Real Estate Investment Trusts (REITs) have emerged as a forest management options that offer competitive returns on investments to capital investors. The Forestry Source (2007) reports that TIMOs and REITs manage timberland worth 35 to 40 billion dollars in the United States. For instance, according to the president of Forest Investment Associates in Atlanta, 20 years ago it was a major challenge to convince investors of the benefits of timber investments. Currently, the greatest challenge faced by timber investment organizations is to find enough timberland (The Forestry Source 2007). The growing demand for energy may open new doors for additional investments in the forest sector.

The objective of this study was to explore the potential for private personal investments in wood-based energy initiatives in the United States[3]. The reason why individual private investors were selected lies on the increasing number of investors who screen for socially responsible funds and want to be informed of how their moneys are invested. Socially responsible investing is often referred to as ethical investing or socially aware investing and often includes environmental investing. According to Schueth (2003),

[3] In this study wood-based energy does not differentiate between technical platforms. It does not differentiate between sources of woody biomass (e.g., established forests, plantations, agroforestry) either.

socially responsible investing has emerged as a dynamic and quickly growing segment of the U.S. financial services industry involving over $2 trillion in professionally managed assets. The Social Investment Forum (2008) reports social investing represents about 11 percent of all current assets under professional management in the U.S.[4] As it has been the case for social investments, it can be expected that individuals will be more interested in screening for specific investment options in sectors such as energy developments that are poised to provide competitive returns on investment while addressing issues of national security and environmental impact. Results presented in this paper are part of a larger effort and only summary findings are reported.

Methods

A survey was designed to collect information among a random sample of current and potential investors in the U.S. The survey consisted of several sections. First, participants indicated whether they have any interest-earning funds (e.g. bonds, certificates of deposit, mutual funds, etc.). The second section collected information on items that are considered by participants when selecting an investment option, followed by a section on views of forests and their services. Section four gathered opinions about the potential of different technologies and feedstocks to generate renewable energy. Section five elicited preferences for different investment profiles and a final section collected demographic characteristics of the respondents. Table 1 summarizes these sections along with the questions included in the survey.

[INSERT TABLE 1 ABOUT HERE]

A database was purchased from a marketing agency screening for individuals who own a house, with a household income of at least $30,000 per year and with equal number of males and females. This profile for respondents is used as a proxy for potential energy investors. Data collection took place in the summer of 2008. The survey process followed the general guidelines of the Tailored Design Method (Dillman 2000), but only one round of mailing was completed because of limited funds.

The profiles of hypothetical investment options included in Section 5 of the survey constitute combinations of the three attributes outlined in Table 1 (annual return on investment, investment type, and geographic location). A fractional design was used to overcome information overload problems (Hair et al., 1998). A total of 9 investment profiles were generated and included in Section 4 of the survey. Figure 1 shows the profiles used in the study. Each participant was asked to rate each of the nine investment profiles according to their preferences using the 1 to 7 scale immediately below each profile that is indicative of willingness to invest. Further details on survey methods are available from the author. Full details on the design and data collection methods on the study of investment preferences can be found in Aguilar (2009).

[4] The Social Investment Forum also reports that social investments assets rose more than 324 percent from $639 billion in 1995, to $2.71 trillion in 2007. During the same period, the broader universe of assets under professional management increased less than 260 percent from $7 trillion to $25.1 trillion.

[INSERT FIGURE 1 ABOUT HERE]

Results

Demographics and current investments

Findings are based on the returned questionnaires from 217 individuals that after adjusting for incomplete and blank responses resulted in a sample of size 1,011 observations for the study of preferences for investment profiles. Of all respondents, 88.8% indicated they currently have at least one form of interest producing investment.

Forty-five percent of respondents were female and represent age groups between 26 and 45 years (33%), 46-65 years (48%) and older than 65 (19%). The levels of education represented in the respondents were those who have completed high-school (21%), hold a 2-year college degree (16%), have obtained a 4-year college degree (35%) and hold a post-graduate degree (27%). Among respondents 62 percent hold at least a 4-year college degree. Forty-one percent of respondents indicated a gross household annual income of at least $100,000, 42 percent reported an income between $50,000 and $99,999, 17 percent had an income between $25,000 and $49,999, and less than one percent reported an annual income below $25,000. The description of respondents was deemed to properly reflect the original profile of potential wood energy investors.

Most important characteristics when selecting an investment option

Participants ranked certainty about future benefits from investments, high returns on investments, and the diversity of investment portfolio as the top characteristics considered when selecting an investment option. At the lower end of the list are the environmental and social impacts of investment activities. The least important of the eight characteristics included in the survey refers to location of investments in the U.S. It is worth noting that this study targeted investments in renewable energy enterprises uniquely. Nevertheless, outputs from enterprises might be "exported" to other states (e.g. electricity from biomass sources sent to other states) or even countries (e.g. pellets manufactured in the U.S. but sent to Europe). This finding also has direct implications to support projects that support more distributed, rather than centralized, energy systems such as district heating systems. This finding will be stressed in the study of investment profiles.

[INSERT FIGURE 2 ABOUT HERE]

This first set of responses suggested that decisions to select investments will primarily be driven by expected returns on investments and certainty over those benefits. While those aspects do not directly involve investments in renewable energies, the possibility of diversifying portfolios (ranked third) can make new investment instruments attractive.

Forests, their services and forest management

The ranking of services by forests are displayed in Figure 3a. At the top of the list rank the capacity of forests to provide wildlife habitat, create beautiful landscapes, protection of soil from erosion, and provide society with wood products and recreational opportunities. This finding is consistent with other surveys gathering public perception of forest resources such as the Missouri Department of Conservation's report on citizens' attitudes towards forest resources (Constance and Rikoon 1997). In that survey the provision of wildlife habitat by forests was rated as "Very important" (84% of respondents). It is interesting to observe that the service with the lowest ranking corresponds to the capacity of forests to help reduce global warming. This latter finding might be a reflection of how the public attention may be concentrated on the issue of greenhouse gases emissions (primarily from fossil fuels) rather than their potential sinks (such as forests).

[INSERT FIGURE 3A ABOUT HERE]

With respect to forest management, there is a much lower level of agreement with the proposed statements than in any of the previous sections (Figure 3b). At the top rank statements about the use of fires controlled by professionals to keep healthy forests, professional forest management can help reduce the occurrence of wildfires and tree harvesting should be down in small patches to avoid clearing of large tracts. At the opposite end of the scale were disagreements with statements about tree harvesting *only* occurring in public forestlands, naturally occurring forests and forest plantations. These findings suggest that participants see public and private forests as a source of wood products and tree harvesting should not be restricted to neither of them.

[INSERT FIGURE 3B ABOUT HERE]

Opinions about potential for different renewable feedstocks to generate renewable energy

Figure 4 shows the average ratings of the six technologies and feedtsocks included in the study as sources of renewable energy. Wind and solar technologies were clearly ranked as the two platforms with the highest potential to generate renewable energy. The use of wood materials from forests to generate energy was only second to last. The average response (2.59) corresponds to a "Disagree" to "Neither agree nor disagree" agreement with the statement "Wood from forests can play an important role in generating renewable energy". The study of willingness to invest that is presented next will further investigate the preferences for renewable energy investments and the factors influencing such preferences.

[INSERT FIGURE 4 ABOUT HERE]

Investment profiles

Results from the investment profiles were analyzed using an ordinal model. In commonly used least squares regressions, the value of the variable modeled is assumed to be continuous which is obviously not the case of the scale used in the study of willingness to invest (1 to 7 ordinal scale). Instead, a model that uses the ordinal information of the responses to estimate the effect of each variable on consumers' willingness to invest was applied following maximum likelihood estimation (Wooldridge 2002). The model also assumes there is random unmeasured noise in the responses that follows a logistic distribution. The regression models participants' stated willingness to invest as a function of the following explanatory variables included in the investments profiles: expected returns, type of investment, and geographic location. The model also captured effects from the participant's age, income level and gender. Table 2 summarizes the results of the model.

[INSERT TABLE 2 ABOUT HERE]

The main findings of the model include the following:

- Wood-based energy ranked below preferences for investments in the stock market and solar/wind energy. In fact, solar/wind energy investments rank even higher than the stock market. [5]
- Potential investors in wood-based energy, nevertheless, expressed strong preferences for local investments and those happening within the U.S. Groups of potential investors between 26 and 35 years old are the most likely to invest.
- Prospects for investments in wood-based energy were significantly higher among individuals who had a favorable view of tree harvesting as part of forest management. This finding can be related to the issue of appropriate scale of wood-for-energy operations which aims at reducing the risk of resource degradation.
- Prospects for investments in wood-based energy will also be higher if it can be demonstrated to potential investors that this technology can yield competitive returns. Return on investments is still a major driver of investment preferences.
- A pool of potential investors will be among those more familiar with the sector, thus efforts aimed at finding private investors should be targeted to individuals and regions where the forest sector is a major player in the economy. Some of these groups may include Professional Foresters, and individuals in the U.S. South and Pacific Northwest regions were most of wood product manufacturing takes place in the country.
- The pool of potential investors can be increased if expected minimum returns on wood-based energy forestry and views towards forest management are more favorable.

Conclusions

Although wood-based energy investments did not receive the same level of preference among potential investors as the stock market and other renewable energies did, the development of investment instruments for wood-based energy platforms within the U.S. still have promising prospects. The fact that

[5] It is worth noting that this survey was completed over the summer of 2008 prior to massive losses in the Stock Market (Stocks crushed. Approximately $1.2 trillion in market value is gone after the House rejects the $700 billion bank bailout plan. Online at http://money.cnn.com/2008/09/29/markets/markets_newyork/index.htm?cnn=yes). Investment preferences may have changed following by recent loss of stock market value, thus, making other options that were less appealing prior to these events more competitive.

preferences for these types of investments are higher among those who agree with forest management practices indicates that efforts aimed at seeking potential investors should be done among groups that would favor this premise (e.g. professional associations) and regions where the forest sector is an important component of the economy. Options for investments following TIMOs and REITs structure look like feasible investment models.

Return on investments and certainty of those investments were two of the most important characteristics considered when investing according to study participants. If wood-based energy investments can be shown to earn competitive returns and energy markets continue in the raise, the prospects for investments will continue to grow. Furthermore, if a link can be established between the benefits of woody biomass treatments to improve forest health, wildlife habitat and reduce the risks and magnitude of wildfires prospects will be even more promising. Wood energy investments can also be attractive as an alternative to diversify investment portfolios.

Public financial support is currently used to develop technologies that make the most efficient use of woody materials. Private investments then will be instrumental to launch commercially viable initiatives around the country. Furthermore, the commercial feasibility of wood-for-energy initiatives will require access to woody biomass from privately and publicly-owned lands (Government Accountability Office 2006). Given the growing interest in individuals to know about the location of their investments, U.S. energy investments can be essential in attracting investors' interest in this growing sector.

References

Adams, D.M., Haynes, R.W., Dutrow, G.F., Barber, R.L., and J.M. Vasievich, 1982. Private Investment in Forest Management and the Long-Term Supply of Timber. *American Journal of Agricultural Economics*. 64:232-241.

Aguilar, F.X. 2009. Investment preferences for wood-based energy initiatives in the US. Energy Policy. doi:10.1016/j.enpol.2009.02.016.

Bodman, S., and E. Schafer. 2008. Letter to Senator Bingaman, Committee on Energy and Natural Resources. Available online at www.energy.gov/media/Secretaries_Bodman_and_Schafer_Ltr_to_Sen_Bingaman.pdf. June 11, 2008.

Commonwealth of Pennsylvania. Governor Rendell Signs Biofuels Development And Incentives Acts To Strengthen National Security, Spur Economic Development. Governor's Office of the Budget. http://www.budget.state.pa.us/budget/cwp/view.asp?a=3&Q=219782&PM=1.

Constance, D., and J Rikoon. 1997. Missouri Citizens' Attitudes Towards Forest Resources: Comparative and Present Perspectives. Available online at http://www.mdc.mo.gov/forest/research/survey.htm

Dillman, D.A. 2000. Mail and Internet Surveys: The Tailored Design Method. John Wiley and Sons, New York.

Forestry Source, The. 2007. Merill Lynch Investors Bullish on Timberland. *The Forestry Source*. 12(11): 1-7. January 10, 2008.

Government Accountability Office. 2006. Woody Biomass Users' Experiences Offer Insights for Government Efforts Aimed at Promoting Its Use. GAO-06-33. Available online at http://www.gao.gov/new.items/d06336.pdf.

General Assembly of the State of Missouri. 2008. Senate Bill No. 931, http://www.senate.mo.gov/08info/pdf-bill/tat/SB931.pdf

Hair, J.F., Anderson, R.E., Tathan, R.L. and W.C. Black. (1998). Multivariate Data Analysis. 3rd ed. MacMillan Publishing Co. New York. 730 p.

Public Law 110–140. Energy Independence and Security Act of 2007. December 19, 2007 Available online at http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_public_laws&docid=f:publ140.110.pdf; March 15, 2008.

U.S. Energy Information Administration. 2008a. How dependent are we on foreign oil? Available online at http://tonto.eia.doe.gov/energy_in_brief/foreign_oil_dependence.cfm

U.S. Energy Information Administration. 2008b. World Crude Oil Prices. Available online at http://tonto.eia.doe.gov/dnav/pet/pet_pri_wco_k_w.htm

Schueth, S. 2003. Socially responsible investing in the United States. *Journal of Business Ethics*. 43(3):189-194.

Social Investment Forum. 2008. 2007 Report on Socially Responsible Investment Trends in the United States. Available online at www.socialinvest.org/resources/pubs/documents/FINALExecSummary_2007_SIF_Trends_wlinks.pdf; March 15, 2008.

Wooldridge, J.M.. 2002. Ordered Response Models. P.504-509. In Econometric Analysis of Cross Section and Panel Data. The MIT Press.

Table 1. Summary of sections and scales used in each of them

Section	Scale used
1. Money investments: - Do you currently have any money invested? Investments include any form of interest producing activities such as saving accounts, bonds, certificates of deposit, futures, mutual funds, variable annuities, etc.	Yes/no (1/0)
2. Importance of characteristics when deciding investment option - High return on investment - Certainty about the future benefits of investments - Time of return on investment (how long it takes to obtain interests) - Environmental impact caused by investment activities - Social impact of investment activities - Location of investments in the USA - Location of investments overseas - Image of the company managing investment options - Diverse investment portfolio	Ordinal 1 to 7 scale of importance 1=Not important 4= Indifferent 7=Very important
3. Forests and their services - Forests help protect water sources - Forests provide protection from natural disasters such as floods or storms - Forests do not keep the air clean by capturing air pollutants - Forests help reduce global warming - Forests provide habitat to mammals, birds, insects and other animals - Forests help protect many species of animals from extinction - Forests provide society with wood products - Forests are not essential to the survival of the human species - Forests are threatened by human developments (e.g., new construction) - Forests provide recreational opportunities to society - Forests create beautiful landscapes - Forests protect soils from erosion caused by heavy rain or strong winds	Ordinal 1 to 5 Likert scale 1= Strongly disagree 3= Neither agree nor disagree 5= Strongly disagree
4. Opinions about potential for different technologies and feedstocks to generate renewable energy - Crops such as corn or soybeans can play an important role in generating renewable energy - Grasses such as switchgrass can play an important role in generating renewable energy - Wood from forests can play an important role in generating renewable energy - Solar technology can play an important role in generating renewable energy - Wind technology can play an important role in generating renewable energy - Hydrogen technology can play an important role in generating renewable energy	Ordinal 1 to 5 Likert scale 1= Strongly disagree 3= Neither agree nor disagree 5= Strongly disagree
5. Preferences for investment profiles Conjoint analysis attributes: - Expected return on investments: 5%, 10%, 15% - Investment type: stock market, wood-based energy, solar/wind energy - Geographic location: Own state, within the U.S., abroad	Preference for investment profiles on a 1 to 7 scale 1=Least likely to invest 4= Indifferent 7=Most likely to invest
6. Demographic information: - Age - Annual gross household income - Gender - Education level	Information gathered about age, income, gender and education of participant

Table 2. Estimation of Willingness to Invest (WTI) preferences for investment options using an ordered logit model. Model: WTI= *f* (Expected returns, type of investment, geographic location, participant's age, income level and gender)

Explanatory variables	Effect of variable on Willingness to Invest	*Significance*
Expected returns*	++	√
Solar/wind energy*	++	√
Wood-based energy*	--	√
Investments within the U.S.	None	
Investments abroad*	-	√
Age group 2: 26-35 year-old*	++	√
Age group 3: 36-45 year-old*	+	√
Age group 4: 46-55 year-old*	++	√
Age group 5: 56-65 year-old*	++	√
Age group 6: > 65*	+	√
Income group 2= $25,000 - $49,999	+	
Income group 3=$50,000 - $74,999	-	
Income group 4=$75,000 - $99,999	None	
Income group 5=$100,000 - $149,999	+	
Income group 6=>$150,000	+	
Gender variable indicating females	None	
Wood_energy × Harvest*	+	√
Wood_energy × Healthy forests*	+	√
Wood_energy × Minimum return*	+	√

"++" Indicates highly positive effect on WTI (e.g. increase in that variable will increase WTI), "+" Indicates positive effect on WTI. "-" Indicates negative effect on WTI. √Indicates variables statistically significant at α=0.05.
Interactions with wood-based energy investments:
- Wood_energy × Harvest: Attitude elicited on 1 to 5 scale indicating level of agreement with statement "Forest land management includes harvesting of trees for commercial uses followed by their natural regeneration or reforestation" (1=Strongly disagree; 3=Neither agree nor disagree 5=Strongly agree).
- Wood_energy × Healthy forests: Attitude elicited on a 1 to 5 scale indicating level of agreement with statement "Healthy forests require the harvesting of small, sick or damaged trees". (1=Strongly disagree; 3=Neither agree nor disagree 5=Strongly agree).

- Wood_energy × Minimum return: Attitude indicative of respondents who believe wood-based energy investments can generate average annual returns greater than 5 percent. Binary variable (1=Agree in such minimum return; 0=Other).

Investment profile 1	
Return on investment	10%
Type of investment	Wood-based
Location of investment	Own state

○1 ○2 ○3 ○4 ○ 5 ○6 ○7

Least likely to invest — *Most likely to invest*

Investment profile 2	
Return on investment	15%
Type of investment	Solar/wind
Location of investment	International

○1 ○2 ○3 ○4 ○5 ○6 ○7

Least likely to invest — *Most likely to invest*

Investment profile 3	
Return on investment	10%
Type of investment	Stock market
Location of investment	Own state

○1 ○2 ○3 ○4 ○5 ○6 ○7

Least likely to invest — *Most likely to invest*

Investment profile 4	
Return on investment	5%
Type of investment	Solar/wind
Location of investment	Own state

○1 ○2 ○3 ○4 ○ 5 ○6 ○7

Least likely to invest — *Most likely to invest*

Investment profile 5	
Return on investment	15%
Type of investment	Wood-based
Location of investment	Within the United States

○1 ○2 ○3 ○4 ○5 ○6 ○7

Least likely to invest — *Most likely to invest*

Investment profile 6	
Return on investment	10%
Type of investment	Solar/wind
Location of investment	Within the United States

○1 ○2 ○3 ○4 ○5 ○6 ○7

Least likely to invest — *Most likely to invest*

Investment profile 7	
Return on investment	15%
Type of investment	Stock market

Investment profile 8	
Return on investment	5%
Type of investment	Stock market

Investment profile 9	
Return on investment	5%
Type of investment	Wood-based

Location of investment	International

○1 ○2 ○3 ○4 ○ 5 ○6 ○7

Least likely to invest — *Most likely to invest*

Location of investment	Within the United States

○1 ○2 ○3 ○4 ○5 ○6 ○7

Least likely to invest — *Most likely to invest*

Location of investment	International

○1 ○2 ○3 ○4 ○5 ○6 ○7

Least likely to invest — *Most likely to invest*

Figure 1. Profiles used in the study of preferences of potential investors for wood-based energy investments.

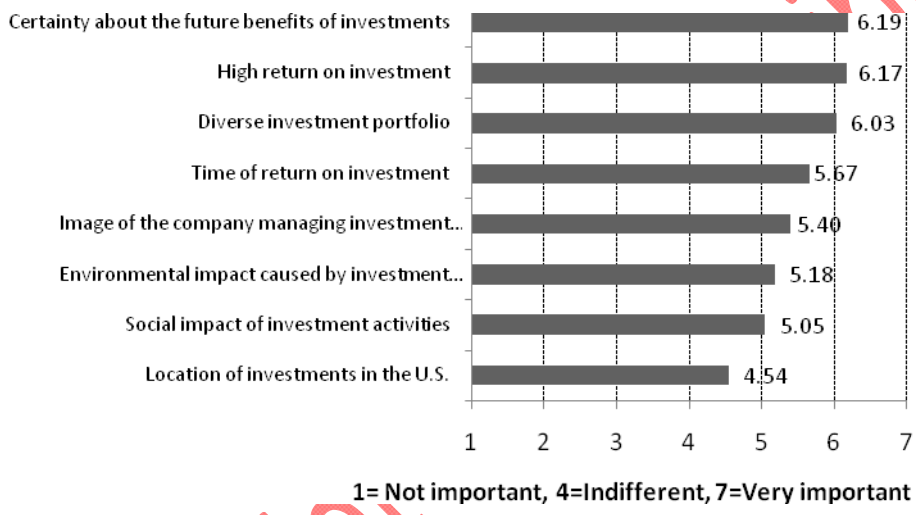

Figure 2. Rating of characteristics considered when selecting an investment option.

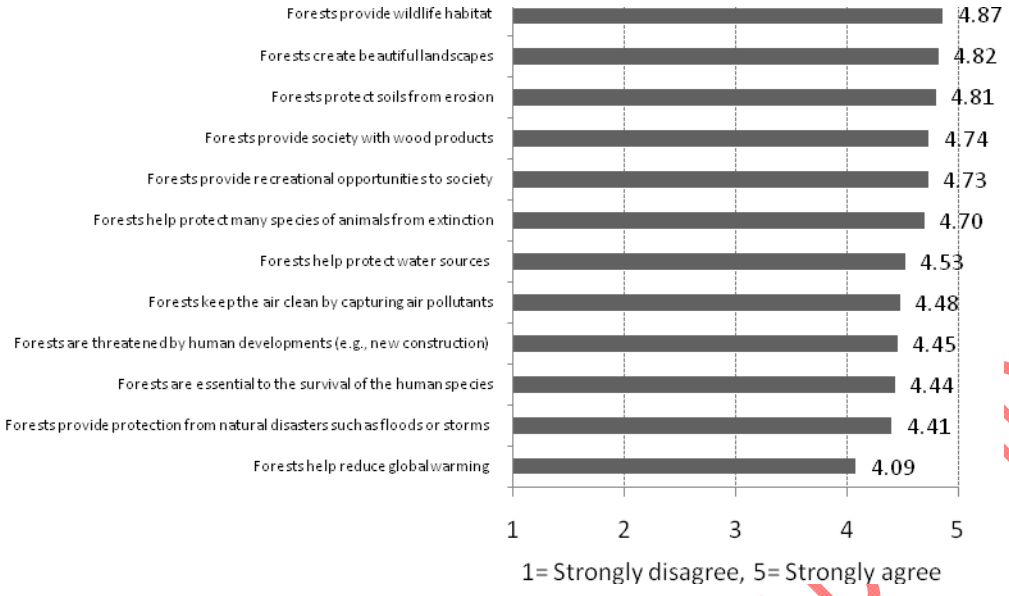

Figure 3a. Importance of forest services

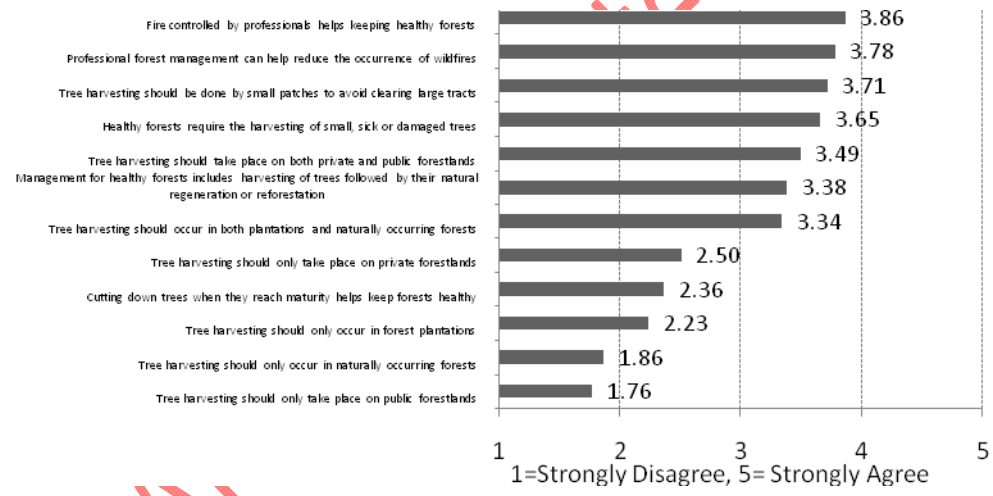

Figure 3b. Level of agreement/disagreement with forest management and tree harvesting statements.

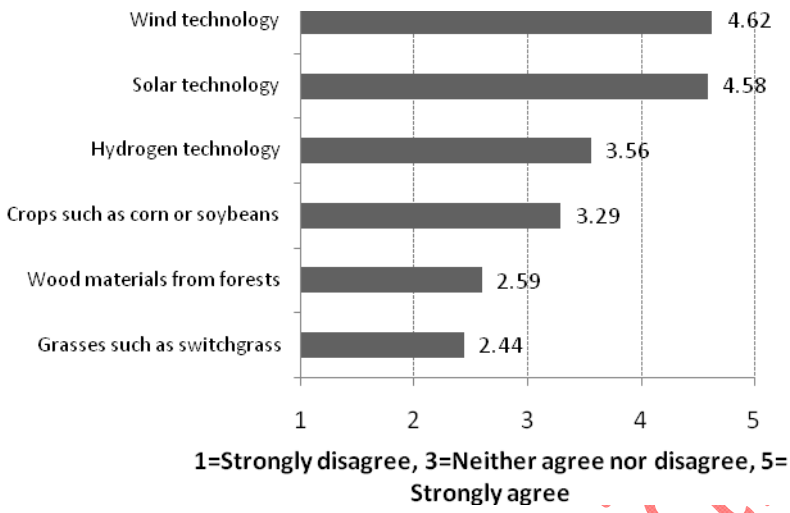

Figure 4. Level of agreement/disagreement with statements regarding the potential of different technologies and feedstocks to regenerate renewable energy.