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CRITICAL FACTORS FOR THE SOCIAL ACCEPTANCE OF RENEWABLE ENERGY TECHNOLOGIES: A SURVEY ON PERCEIVED PRIORITIES

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SOCIAL ACCEPTANCE

Climate change is more and more a central and strategic issue for energy policy. Several countries have set targets and support schemes to increase the share of renewable energy. Many Governments have developed policies aimed at increasing the share of renewable energy often neglecting a factor that seems to be a powerful barrier for reaching the targets: the social acceptance of energy technologies.
Understanding what people expects from the future energy technologies can help designing successful policies. Although public generally shows positive attitude towards renewable energy, proposals for new plants are often hardly opposed. Moreover more efficient devices and energy saving behaviors have a diffusion rate lower than expectations.
Energy investments have been driven by technological analysis. Social expectations have been taken into account only rarely in the past, while they are the basis of consensus on new energy projects.
The knowledge of social expectations can helps the identification of effective actions aimed at giving proper answers to the questions of people that are often opposing investments simply because they do not have transparent information.
This research examines the perceived most important factors for improving social acceptance of renewable and new energy technologies and analyses the different perceptions for different categories of people.

METHOD

An empirical research has been conducted on social acceptance of energy technologies via an online survey in Italy on a test population of 3223 persons. The survey was conducted between August 2009 and January 2010. Respondents have been profiled by gender, age, education level, responsibility assignments and professional area.
Answers were linked to respondents in order to analyze the perceptions among categories of people. Data were analyzed using a multifactor ANOVA procedure and where statistical differences have been found a multiple range test were conducted.

Table 1 shows technologies considered in the survey.

ST	Solar water heating	BH	High capacity hydroelectric plants (capacity > 1 -10 MW)	NU	Nuclear power
PV	Photovoltaic	SH	Low capacity hydroelectric plants	WP	Wave power technologies
SE	Solar thermal electricity generation	BW	High capacity wind turbines (height of plant >30 m)	TE	Traditional thermo electrical fossil-fueled plants
BS	Solid biomass fueled plants	SW	Low capacity wind turbines		
BG	Biogas fueled plants	CC	Carbon Capture and Storage technology		

Table 2 describes the questions asked in the survey.

Perceived dimension: what is the perceived dimension of this technology?
Perceived risk: how risky do you think this technology is?
INF - Information: how important is information (campaigns, conferences, meetings, mass media broadcasts, etc) to improve the social acceptance of this technology?
DEC - Share decisions: how important is the possibility for the stakeholders to participate in the decision process, developing and planning meetings in order to improve social acceptance of this technology?
ECO - Share economic benefits: how important is the sharing of economic benefits (low taxes, financial participation, etc) with interested population in order to promote the social acceptance of this technology?
ENV - Environmental cause: do you think that underlining the beneficial effects of this technology is important for improving its social acceptance?
IND - Energy independence factor: do you think that the increased energy independence gets by this technology is an important factor for improving its social acceptance?
SCI - Scientists' opinion: how important is the opinion of scientists for improving social acceptance of this technology?
POL - Politicians' opinion: do you think the opinion of politicians is an important factor for improving the social acceptance of this technology?
Technology evolution: how much room for technology evolution has this technology?
Expected capacity: how much capacity you expect will be installed in the next 20 years for this technology?

RESULT AND DISCUSSION

The paper discusses the results of the survey and highlights the discrepancies of the perception of technologies among different social categories.

Table 3 shows the ranking of perceived dimension and risk of the considered technologies from highest to lowest.

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th
Dimensions	NU	BH	TE	BW	CC	WP	SE	BS	BG	PV	SH	SW	ST
Risk	NU	TE	CC	BH	BG	BS	WP	BW	SH	SE	SW	PV	ST

Table 4 shows the ranking of factors that are perceived most important for improving social acceptability of each technology.

	1st	2nd	3rd	4th	5th
ST - Solar water heating	ENV	IND	INF	ECO	SCI
PV - Photovoltaic	ENV	IND	RCO	INF	SCI
SE - Solar thermal electricity generation	ENV	IND	INF	ECO	SCI
BS - Solid biomass fueled plants	ENV	ECO	INF	SCI	IND
BG - Biogas fueled plants	ENV	ECO	INF	SCI	IND
BH - High capacity hydroelectric plants	ENV	ECO	IND	DEC	SCI
SH - Low capacity hydroelectric plants	ENV	IND	INF	SCI	ECO
BW - High capacity wind turbines	ENV	INF	ECO	IND	SCI
SW - Low capacity wind turbines	ENV	INF	IND	SCI	ECO
CC - Carbon Capture and Storage	INF	SCI	ENV	DEC	ECO
NU - Nuclear power	DEC	INF	SCI	ECO	ENV
WP- Wave power	ENV	INF	SCI	IND	ECO
TE - Traditional thermoelectric plants	DEC	SCI	ECO	INF	IND

Legenda	
INF: information	ENV: environmental cause
DEC: sharing decisions	IND: energy independence cause
ECO: sharing economic benefits	SCI: opinion of scientists
	POL: opinion of politicians

Some interesting information emerges from the table that is discussed on the paper.

Table 5 shows the ranking for the expected technology evolution and the expected installed capacity in the next 20 years.

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th
Expected technology evolution	PV	SE	WP	CC	SW	BW	ST	NU	BS	BG	SH	BH	TE
Expected installed capacity in the next 20 years	PV	ST	BW	SW	SE	BS	BG	SH	WP	CC	TE	NU	BH

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