

Nuclear Energy and Public Opinion in Spain

Víctor Pérez-Díaz and Juan Carlos Rodríguez

The conditions of the world energy markets (high price of oil, undertakings to reduce greenhouse gas emissions, geopolitical uncertainties) have seen a return to the world arena of the nuclear energy question, nearly two decades after it was considered taboo. In the past three or four years several countries have reaffirmed their nuclear strategies, while others have initiated ambitious projects, and a variety of international organisations and forums have taken steps forward in this field.

The supporters of the peaceful use of nuclear energy have two arguments to back up their position. The most prudent claim to be agnostic on the issue of whether or not new nuclear power stations should be built, but propose that this option should not be excluded. The least timid plead for an expansion in the electrical production capacity of nuclear power stations. This group includes the International Energy Agency (IEA), several representatives of energy companies, several experts and some politicians.¹

The arguments submitted in support of the expansion of nuclear capacity are the following. First of all, the nuclear option must form part of the transition to a future that is less dependent on oil (and other fossil fuels). Secondly, energy demand will continue increasing for quite some time. In order to respond to this increase the contribution of renewable energies will not be sufficient in the medium term. Thirdly, nuclear energy reduces the dependence on outside energy sources, an increasingly serious problem in view of geopolitical instability in the Middle East and the anti-West policies adopted by countries such as Iran and Venezuela. Fourthly, nuclear energy is needed in the short term to guarantee supply, since renewable energies depend too much on meteorological factors, and in the medium to long term because nuclear energy can contribute, along with other forms of energy, to

Víctor Pérez-Díaz, Professor of Sociology, Complutense University of Madrid, and Director of Socio-Political Analysts. **Juan Carlos Rodríguez**, Associate Professor of Sociology, Complutense University of Madrid, and Researcher, Socio-Political Analysts.

counteracting the increasing scarcity of oil. Finally, nuclear energy has practically zero greenhouse gas emissions.

The force of all these arguments, which is considerable in the medium term, could change in the longer term due to various factors, including the effect of technological innovations of all types, such as that related to obtaining clean coal (which would, in turn, substantially change the geopolitics of energy on a global scale). In any case, all the arguments in favour of nuclear energy continue to face one very strong counter-argument. It is not that of the security of nuclear power stations, or of the risk of nuclear proliferation on the part of terrorist or 'rogue' states; it is the argument which stresses the dangers of highly radioactive waste, a problem that has yet to be fully resolved.

Spain has also seen the return of the nuclear question, generally brought up by experts and business associations, but also by trade unions (Rodríguez and Pérez-Díaz, 2007). The dominant position adopted by these groups has been the least ambitious one, although some people and organizations have asserted that Spain's current number of nuclear power stations should be expanded. The political class has in general been reticent about embarking on a wide-ranging discussion of this issue. This is especially the case of the two main political parties, which have slightly different viewpoints. The PSOE is of the opinion that the nuclear power stations which are currently functioning should be allowed to come to the end of their useful lives, but that no more should be built. The Partido Popular appears to suggest that the stations which are currently operating could be replaced by other new ones. Rapid closure of the stations is the stance adopted by a small minority sector of the political class (Izquierda Unida), and ecological associations such as Greenpeace and Ecologistas en Acción.

In any case, reticence towards open discussion of the issue is basically due to the fact that public opinion is clearly against nuclear energy. It is possible to imagine a scenario in which the two largest parties agree on a policy of conserving the current number of nuclear power stations, while expanding their capacity. But even such a policy could be postponed indefinitely and never be carried out because both parties are equally worried about the reaction of Spanish society at large.

This article aims to analyse the precise characteristics of these public attitudes, which, as we shall see, are not as one-sided as is generally thought. Above all, our analysis suggests that a wide-ranging and fruitful

1. This article is based on a study on the "Sociology of energy", sponsored by the Club Español de la Energía, which gave rise to the book written by Víctor Pérez-Díaz and Juan Carlos Rodríguez entitled *Energía y sociedad: actitudes de los españoles ante los problemas de la energía y el medio ambiente* (Pérez-Díaz and Rodríguez, 2008). The book analyses the results of a survey conducted on a representative sample of the Spanish population aged between 18 and 75 by Analistas Socio-Políticos, with fieldwork dating from June 2007.

discussion can be held on the nuclear question in Spain if the main participants ensure that the man on the street has his say and everyone's understanding of the issue increases, as do levels of mutual confidence.

The majority rejects nuclear energy

When the question is posed in general terms, that is, for or against nuclear energy, various recent surveys indicate that around 70 per cent of Spaniards reject it. In February-March 2005, some 71 per cent were opposed to energy produced via nuclear power stations, and only 16 per cent were in favour, which was some way short of the EU-25 average (55 per cent against, 37 per cent in favour), according to a survey by the European Commission (2005). In February 2007, some 72 per cent of Spaniards declared themselves to be against nuclear energy ("the share of nuclear energy should be decreased, as it poses safety problems like nuclear waste or the danger of accidents"), and only 18 per cent were favourable to it ("the share of nuclear energy should be increased, as it does not contribute to climate change and global warming"), far from the EU-25 average (61 per cent against, 29 per cent for), according to the European Commission (2007a).

However, if the question posed allows the interviewee to express degrees of opposition or ponder advantages or disadvantages, the Spanish position is not as negative as it may at first seem. In a survey carried out in May-June 2006, the European Commission used a scale of 1 (outright rejection of nuclear energy) to 7 (strong support) to rate the level of support. Taking 1 to 3 as rejection, 4 as a neutral position and 5 to 7 as acceptance, rejection in Spain reached 47 per cent, the neutral position 13 per cent and support stood at 26, results that were similar to the European average (48, 13 and 32 per cent, respectively) (European Commission, 2007b). In October-November 2006, public opinion against nuclear power was reaffirmed in a question on the risks and benefits of nuclear energy: some 55 per cent believed that the risks of nuclear energy surpassed the benefits, whereas 23 per cent thought the opposite, thus reflecting a level of rejection above the EU-25 average (53 vs 33 per cent) (European Commission, 2007c).

In a survey conducted in June 2007 by *Analistas Socio-Políticos* for the *Club Español de la Energía*,² those polled had to choose one of four positions regarding the future of nuclear power stations in Spain: increase their number; maintain their current number by replacing them as they close; close them gradually, without setting up new ones; and rapidly close them all, without setting up any new ones. The option that received most support

2. Henceforth referred to as ASP (2007). The results are collected in Pérez-Díaz and Rodríguez (2008).

was that of gradual closure, preferred by 43 per cent, followed by that of maintaining the current number of stations (24 per cent), followed by that of quick closure (20 per cent), and that of expansion (9 per cent).

In a survey conducted in December 2004 by the Foro Nuclear (Nuclear Forum), other political options regarding nuclear power stations were considered: some 59 per cent supported the idea of gradually closing the stations, a figure not too distant from that obtained in our survey (some 62 per cent in favour of closure); 23 per cent, meanwhile, opted for allowing the current stations to continue until the end of their useful life; and only 12 per cent were inclined towards building new stations to respond to electricity demand in Spain (Foro Nuclear 2005).

Advantages of nuclear energy

It goes without saying that these basic positions on whether to reduce, maintain or increase the number of nuclear power stations in Spain are by no means constant. In fact they fluctuate, and are perhaps even based on indecision. There is something of a conversation on these concerns being held in Spanish society, which is why the earlier description should be considered in the context of how opinions on these issues are distributed throughout the population at large, and how this conversation is affected by the different ways in which it is framed. The attitudes of Spanish citizens regarding nuclear energy – and those of Europeans as a whole – are associated with their understanding of its benefits, in terms of diversification of sources, for example, or global warming. These attitudes are also affected by the perception of the risks of nuclear energy, such as nuclear accidents, the risks derived from the storage of radioactive waste, and the corresponding health risks. Finally, they are affected by what is known about nuclear energy and how related arguments are constructed. Let us first turn to opinions on the advantages of nuclear energy.

In the ASP survey of 2007, opinion was very divided on whether the use of nuclear energy allowed European countries to diversify their sources of energy: some 42 per cent agree with this idea, while 48 per cent do not (ASP 2007). The level of agreement has tailed off since the European Commission's 2005 survey, which situated it at 53 per cent, and the level of disagreement has increased (it was 20 per cent in 2005). Spain is one of the European countries with the lowest level of recognition of this advantage.

Nuclear energy's "advantage" with respect to its minimal greenhouse gas emissions is accepted by a greater percentage of the population: in 2007, some 53 per cent agreed that "an advantage of nuclear power is that it produces less greenhouse gas emissions than other energy sources, such as oil or coal", although 36 per cent still disagreed (ASP 2007). The opinion had

also changed since 2005, when 45 per cent were in agreement and only 22 per cent disagreed (European Commission, 2005). Spain, once again, was one of the countries that was most critical of nuclear energy.

Risks: accidents, waste, health

With regard to nuclear accidents, many Spaniards consider that a serious nuclear accident in Spain is probable. In 2007, some 44 per cent believed that it was probable that a serious nuclear accident would occur in one of the country's seven nuclear power stations in the next 10 years, and a few more (50 per cent) considered it improbable (ASP 2007). Spaniards are not the only ones with these fears. According to a survey conducted by the Massachusetts Institute of Technology (MIT) in February 2007, which asked a similar question and which also reminded those polled of the number of nuclear power stations in the United States (around 100) and the Three Mile Island accident of 1979, some 30 per cent considered that in the next 10 years an accident was almost certain or highly probable, some 28 per cent considered it fairly probable, and around 26 per cent as improbable or almost impossible (Ansolabehere 2007). In addition, around 30 per cent of those polled by Fundación BBVA in 2007 considered that it was probable that a nuclear accident would occur in the next five years affecting many countries, including Spain (Fundación BBVA, 2007).

Turning to the question of storage and disposal of radioactive waste, the vast majority do not believe that the waste can be stored away in a secure manner for ever. In 2007, around 71 per cent did not agree that "radioactive waste can be stored away in a secure manner for many years" (ASP, 2007). In addition, a study by Spain's Centro de Investigaciones Sociológicas (CIS) in 2000, revealed that 89 per cent of those polled believed that living near a radioactive waste storage area posed a radiation risk to those living there (CIS, 2000). Ample majorities also believed that the risks of waste storage were high (74 per cent), as were the risks related to the transport of waste (64 per cent). This same survey revealed considerable doubts regarding current solutions to the problem of waste, since around 55 per cent did not believe that current technology had found acceptably safe solutions to the problems of storage and transport of waste, while some 56 per cent rated the security measures currently in place in Spain as insufficient.

Finally, it is well known that the risk to health is one of the main reasons for the public's rejection of nuclear energy. The nuclear energy risk that is perceived as the most probable is the increase in diseases caused by exposure to radioactivity, which was mentioned by 53.5 per cent of those polled in the CIS survey. Along the same lines, a survey of 16-35 year old

Spaniards conducted by *Analistas Socio-Políticos* in 2004 found that 65 per cent perceived nuclear energy as the source of electricity that caused the most damage to one's health, way above the proportion who pointed to oil (26 per cent) (Pérez-Díaz and Rodríguez, 2005).

In addition, when Spaniards were asked in February-March 2005 about their main concerns regarding nuclear energy, the majority referred to possible effects on the environment and on health (49 per cent), and to the risks of radioactive leaks while the station was operational (30 per cent); the figures were 53 and 28 per cent, respectively, for the EU-25 as a whole (European Commission, 2005). What is more, in October-November 2006, some 60 per cent of Spaniards believed that the country's nuclear power stations posed a risk to their health and that of their families, making Spain the fifth most fearful of the EU-25, and above the EU-25 average (53 per cent), according to the European Commission (2007c).

Ignorance about nuclear energy

In general, Spaniards, like Europeans, consider themselves badly informed about nuclear energy, and they most probably are. According to a study carried out by the European Commission in February-March 2005, only around 15 per cent of Spaniards believed that they were well informed about radioactive waste, against some 83 per cent who recognised that they were badly informed, placing Spain in penultimate place in the EU-25, although not very far from the average (25 per cent of well informed citizens, 74 per cent badly informed) (European Commission, 2005). And in October-November 2006, only some 11 per cent of Spaniards thought they were well informed about nuclear power stations, leaving Spain once again in penultimate place (European Commission, 2007c).

Apart from this subjective sensation, we also have direct evidence of this ignorance. Many of those polled by ASP in 2007 underestimated the importance of nuclear power in electricity generation, considered the cost of nuclear energy to be higher than it really is, and overestimated many of the consequences in terms of air pollution. Other examples serve to elaborate on these findings.

In 2000, a study conducted by the International Social Survey Programme asked whether a statement, which was actually false, was believed to be true by those polled. The statement was whether someone exposed to a dose of radioactivity, however small, would definitely die as a result of the exposure. Of the 26 countries that took part, Spain occupied the fifth place in terms of level of error, given that some 49 per cent considered the statement true, a percentage that is very far from the countries with the highest number of correct answers, such as Finland (17 per cent

mistaken) or the United States (26 per cent) (ISSP, 2000). The most striking aspect of this is that the number of errors has not changed over time. In 1997, some 50 per cent considered the statement to be true, while in 2004 it was 41 per cent (ASEP 1997, Díez Nicolás 2004).

In 2002, around 47 per cent of the EU-15 citizens erroneously believed that nuclear energy contributed significantly to global warming and climate change (European Commission, 2003). The Spanish case was even more serious, since some 64 per cent believed it to be true, a level of error only exceeded by that of the Greeks (79 per cent).

The Eurobarometer surveys nos. 227 and 271 (with data from February-March 2005 and October-November 2006, respectively) also revealed striking errors in matters ranging from the technical to notions that could be described as common knowledge. For example, the knowledge of Spaniards on waste storage is clearly inferior to the European average. In a series of five questions, Spaniards succeeded in answering 32 per cent of questions correctly, while the EU-25 average was 44 per cent, placing Spain in position no. 23 (European Commission, 2005). It was striking to note the low number of correct answers regarding the falsity of the statement that radioactive waste is thrown into the sea (24 per cent), and the truth of the statement regarding the packaging of less dangerous waste in steel drums (42 per cent).

In Eurobarometer survey no. 271, a further five questions also served to place Spain among the countries with the lowest number of correct answers. One question that was in principle easy, namely, if there were any active nuclear power stations in the country, was answered correctly by just 76 per cent (European Commission, 2007c). Another two questions required that those polled be up to date with local discussions on nuclear energy, but it was not the case: only some 20 per cent recognised the falsity of the statement that Spain had decided to do without nuclear energy, and only around 15 per cent knew that it was not true that the government had taken a decision on the final handling of radioactive waste. Overall, only around 39 per cent of the replies from Spaniards were correct, against some 57 per cent for the EU-25 as a whole.

The interesting conclusion is that the level of knowledge regarding nuclear energy may have an effect on the opinions expressed towards this form of energy. Looking at the data gleaned by Eurobarometer survey no. 227 (February-March 2005), it is noticeable how the favourable opinions regarding nuclear energy increase hand-in-hand with the degree of knowledge on how nuclear waste is produced and how it is disposed of. The data contained in Eurobarometer survey no. 271 (October-November 2006) bring to light a similar association between knowledge on nuclear power stations and the perception of more advantages than risks in nuclear energy. Both of these associations suggest that the degree of support for nuclear

energy increases in line with the level of knowledge pertaining to the issue in each country.

How the argument is formed and framed

The positions held by people on a complex subject can change considerably depending on how the argument is formed and how people situate themselves in the context of the debate, particularly in relation with groups of reference and countries of reference, which may meet with their approval or disapproval.

In the aforementioned Eurobarometer survey no. 271, after asking the interviewee various questions on whether statements regarding the advantages of nuclear power were true or false, a generic question on the subject was posed. Some 44 per cent of Spaniards believed that the weight of nuclear energy among the different sources of energy should be reduced, only 6 per cent were in favour of increasing it, and around 22 per cent believed that it should be kept at its current level (European Commission, 2007c). The equivalent percentages for the EU-25 as a whole were 39, 14 and 34 per cent. Those who supported a maintenance or reduction of the current levels were then asked the same question, but this time accompanied by a list of some of the advantages of nuclear energy: that it does not emit significant quantities of greenhouse gases, that it lessens dependency on imported energy, that it produces a third of electricity in the EU, and that replacing it with gas would entail the use of far more gas. As was to be expected, the percentage of those ready to rely less on nuclear power was reduced (from 44 to 32 per cent in Spain; from 39 to 27 per cent in the EU-25), and the percentage of those ready to increase levels went up (from 6 to 11 per cent in Spain; from 14 to 21 per cent in the EU-25).

This change in attitude came about within the framework of a conversation between two people, one of whom was trying to persuade the other. In a public discussion, however, attempts at persuasion occur in conditions where an individual susceptible to changing his mind loses the focus of his attention, is distracted by other matters and suffers several interruptions – of an ideological nature, for example. This means that the messages sent out by supporters of nuclear energy may not have the desired effect. If an interview does have the desired effect, albeit with limitations, it alerts us to other ways through which citizens acquire their knowledge and form their opinions. These are more direct means that may imply the use of objective arguments, but which, above all else, are influenced by direct experience and trust in credible people.

Something along these lines is suggested by the association between the opinions on nuclear energy expressed in Eurobarometer survey no. 271 and

close experiences of this type of energy. In this survey, the percentage of those in the EU-25 member states who believed that nuclear energy had more advantages than risks increased if those polled had actually visited a nuclear power station. There was also a positive association between the percentage of those who had worked in the nuclear sector (or who knew someone who had), and affirmation of the advantages of nuclear power.

All this points to considerations that the usual participants in public discussion sometimes forget. Supporters of nuclear power tend to find it difficult not to fall back on a kind of scientific or technical paternalism. Many complain of how badly informed the public is, often adding a complaint regarding the ideological components of the debate. For this reason, some propose that a pedagogical effort be conducted towards public opinion, and others that debate between organised participating groups help persuade society of the need for nuclear energy. Their starting point is a model in which knowledge and opinion-formation are transmitted in a top-down fashion.

However, the attitudinal associations mentioned above suggest that this model of persuasion could prove ineffective, and that it should instead include direct experience and more immediate contact with the authentic experts in nuclear matters. Another issue, that of the demand for participation in relevant decisions on nuclear energy, also helps to explain the limits of top-down persuasion. In June 2007, in reply to a question regarding the establishment of an underground dump of radioactive waste some 100 kilometres from the interviewee's place of residence, some 67.5 per cent replied that they would like to be directly consulted and participate in the decision-making process (ASP 2007). Only 9 per cent would allow the competent authorities to decide without consulting them on this matter. A larger proportion (20.5 per cent) would support NGOs being consulted on and participating in the decision. In a 2005 study by the European Commission, similar proportions were found among Europeans as a whole (European Commission, 2005).

Clearly, these demands for participation can be considered part of a *nimby* (not in my backyard) strategy aimed at blocking any decision. However, the reality may be less evident. On one hand, people may not decide against the dump. Given the current state of public opinion, it would probably not be favourable, but we do not know for certain what would occur following a process of direct involvement of the parties in the conversation. On the other hand, perhaps this betrays a certain amount of distrust toward organised participants who wish to monopolise the decision. It is

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better to take part in these conversations as a way of formulating an opinion on such an important decision than entrust it to distant intermediaries. In other words, the survey replies allow for an interpretation that points to practical proximity to specific affairs as a means of understanding them, and being able to pass judgment on them, or the significance of direct personal relations as a means of genuinely trusting the experts in these matters.

Finally, the hypothetical conversation we are envisaging should also bear in mind the example of other countries, since this provides information that may have a substantive effect on public opinion. In the ASP survey carried out in 2007, we asked those interviewed for an opinion on the French nuclear strategy, described in sober but generally positive terms. Some 57 per cent considered that from a French standpoint the country's decision to rely on relatively low-cost nuclear energy with a capacity to produce electricity that could be exported to countries such as Spain was correct. Only around 30 per cent considered it incorrect. That is to say, when the question is framed in this way, the opinion of Spaniards toward nuclear power turns into positive.

To conclude, our analysis suggests that the best way to enrich the nuclear debate is to improve the public's general knowledge and elaborate arguments with greater care. To achieve this, the usual attempts at top-down persuasion are not enough. As a result, elites need to understand the problems in order to be able to explain them both to themselves and to the rest of the population. In addition, the results of the most recent European and Spanish surveys point to the need to take into account the more or less direct experience of people in these matters, and explore forms of discussion that implicate citizens in a more direct fashion, establishing the bases and the context for a series of continuous, everyday conversations between the public and professionals in the sector, or those with an interest in it, with a view to generating a climate of mutual understanding and trust.

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