

## “Green nudges” : new incentives for ecological behaviour

Many obstacles stand in the way of adopting ecological behaviour, whether material, financial or psychological in nature. These restrictions limit the effectiveness of conventional approaches, which combine awareness campaigns, technological innovations as well as economic and normative instruments. Accordingly, consideration should be given to introducing new methods liable to bring about a lasting change in consumer habits.

Amongst these methods, the use of strategies developed in behavioural sciences –and referred to as ‘nudges’– are gaining momentum. The aim of these strategies is to lead individuals to make choices in the collective interest, without being prescriptive or guilt-inducing at the behavioural level. Applied to sustainable development, this new type of incentive, referred to in this context as ‘green nudges’, uses several behavioural biases such as compliance

to social norms or inertia to change in order to encourage citizens to adopt lifestyles showing a greater respect for the environment. Several field experiments testing the effects of green nudges *in situ* have been conducted in North America for a variety of ecological purposes including energy saving and preventing pollution. These studies reveal encouraging results regarding the operational, effective, adjustable and unrestrictive nature of nudges. These behavioural incentives must however still be refined in order to overcome the various limits observed (unintended side-effects, difficulty in transferring them on a large scale, durability of effects, etc.). Although they are not miracle cures for ecological issues, green nudges remain valuable motivational procedures when used alongside existing instruments. ■

### ➤ PROPOSALS

- 1 Develop the ‘green nudge’ initiatives identified as the most promising in light of other countries’ experiments:
  - utility bills encouraging energy savings by making people compare themselves with others;
  - public operators selecting electronic format as the default means of sending correspondence and billing rather than paper format.
- 2 Create public-private partnerships to devote the potential of smart technologies for green nudges. For example, a display unit connected to a ‘smart’ electricity meter could be installed in private homes to give consumers a better realtime feedback of their energy consumption and savings.

**MAIN ISSUES** Sustainable development and ecological imperatives require not only technological innovations but also changes in individual and collective behaviours. However, although current scientific and technical advances are undeniable, the 'advent of the ecocitizen' is still more of a wish rather than reality. Going from good intentions to ecological actions is proving complex. **However necessary they are, changes in behaviour towards protecting the environment do not happen on demand. They can, however, be encouraged.** This approach traditionally involves the use of information campaigns, tax measures and norms, the benefits and limitations of which are well-known. Some have suggested a **policy of libertarian paternalism<sup>(1)</sup> on environmental issues.** This term is used to refer to a policy aimed at guiding individuals' choices towards decisions that favour the health and well being of the majority. The 'libertarian' aspect refers to the necessity of respecting everyone's freedom to act, decide or even change their minds as it suits them<sup>(2)</sup>. This approach is based on advances in behavioural sciences<sup>(3)</sup> that were designed not so much to decode the psychological mechanisms underlying decision-making but more to take effective action at the end of the chain of events that led to decision-making. These studies are implemented via behavioural strategies, referred to as 'nudges', which are as favoured for their simplicity, their effectiveness and the relatively low cost of implementing them as they are discussed for their limits<sup>(4)</sup>. **So what contribution can behavioural sciences make to the ecological cause?**

Can they contribute towards bridging the gap between displays of 'virtuous intentions' and actual daily behaviour?

## THE THEORETICAL VALUE OF BEHAVIOURAL STRATEGIES

**Ecological behaviour: between knowing, being able to and wanting to**

The gap between will and action, as observed in numerous areas, is also present in environmental issues<sup>(5)</sup>. Although 93% of French people view climate change as a 'serious' or even 'very serious' problem, only one-third of them use a low-CO<sub>2</sub> emission means of transport on a daily basis<sup>(6)</sup>. Thus, ecological standpoints are not necessarily mirrored in corresponding forms of behaviour, especially if this would require making significant changes to daily habits. To explain this ambivalence, some have suggested individuals' lack of knowledge with regard to the risks run and the appropriate behaviours to deal with them. This hypothesis is partially based on a common premise in political policies: "an informed person will make the right choices."

The reality is more complex. Being aware of the ecological virtues of a form of behaviour does not necessarily result in that behaviour being adopted and, in parallel, being in possession of relevant information on behaviours harmful to the environment does not necessarily cause an individual to abandon that behaviour.

Since being conscious of risks is a fluctuating and limited process<sup>(7)</sup>, the interest devoted to ecological issues is often "reduced" in favour of events the consequences of which can be felt more immediately or more intensely in daily life<sup>(8)</sup>.

Moreover, even if the intent to act is present, that intent can be frustrated by certain realities of an economic, psychological and pragmatic nature<sup>(9)</sup>.

Virtuous behaviour often goes against lifestyle and consumer habits and has to overcome *inertia to change*.

[1] Sunstein C. and Thaler R.H. (2003), "Libertarian paternalism is not an oxymoron", *The University of Chicago Law Review*, vol. 70 [4].

[2] Oullier O. and Sauneron S. (2010), "Improving public health prevention with behavioural, cognitive and neuroscience", *Rapports et documents*, Centre d'analyse stratégique (192 p.). [www.strategie.gouv.fr/IMG/pdf/NeuroPrevention\\_English\\_Book.pdf](http://www.strategie.gouv.fr/IMG/pdf/NeuroPrevention_English_Book.pdf)

[3] This branch of the economics uses findings from psychology in order to gain a better, and more realistic understanding of the discrepancies between the actions observed at an individual level and the predictions made based on the standard models in economics.

[4] Stephens J. (2009), "Green nudges: an interview with Obama regulatory Cass Sunstein", *Grist Magazine*.

[5] Kollmuss A. and Agyeman J. (2002), "Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior?", *Environmental Education Research*, vol. 8 (3), 239-260.

[6] European Commission (2009), "European attitudes towards climate change", Eurobarometer 72.1.

[7] Linville P.W. and Fischer G.W. (1991), "Preferences for separating and combining events: a social application of prospect theory and the mental accounting model", *Journal of Personality and Social Psychology*, vol. 60.

[8] Slovic P. (1987), "The perception of risk", *Science*, vol. 236 [4799].

[9] Gertner J. (2009), "Why isn't the brain green?", *The New York Times*, 19 April edition.

Adopting it thus requires a *proactive approach* (such as separating rubbish for recycling), and sometimes not everything is done to facilitate this approach (for example, some cities do not provide adequate receptacles for sorting and disposing of recyclable materials). Furthermore, such an approach generally involves a cost, whether financial (such as the higher price of a hybrid vehicle) or temporal (such as the duration of journeys made by public transport).

Since the (individual and collective) benefits of these actions cannot be observed in the short term, feelings of powerlessness and the difficulty of assessing the 'return on investment' are heightened accordingly<sup>(10)</sup>. Finally, even the most motivated people may be discouraged by the existence of paradoxical situations, largely due to 'free riders' – people who 'do not play along' and take advantage of the acts of others (for example, a cyclist riding in city traffic might be more heavily exposed to the harm caused by urban pollution than someone driving a car with the windows closed).

The scope of these various obstacles is all the greater if the forms of behaviour to be adopted are in the minority and do not constitute the perceived *social norm*.

### **Green nudges as a new type of incentive**

These examples show the **multifactorial character of the elements making adopting ecological forms of behaviour** more difficult.

In this context, knowledge of the psychological mechanisms of decision-making, gleaned from work done in behavioural sciences, could make it possible to facilitate **behavioural changes**.

Such an approach appeals to the sensitivity of our actions and our decisions to their surrounding context, and particularly to the social norms at play. As illustrated by findings in social psychology, what each person perceives as the behaviour generally adopted and/or approved by the group in which they are active will heavily influence their decisions and their actions.

The operationalisation of this behavioural approach occurs through strategies referred to as 'nudges', a concept introduced by the Americans Richard Thaler and Cass Sunstein<sup>(11)</sup> to illustrate the 'helping hand' leading someone to do something...and *in fine* to make better choices for themselves and for the public interest.

Nudges are non-guilt-inducing and non-prescriptive, since the individual always has the option of not following them.

Successful use of nudges has already been made in sectors such as savings accounts<sup>(12)</sup> or public health campaigns<sup>(13)</sup> (*Box 1*). **Extending these campaigns to the field of ecology seems to hold promise, especially since the psychological factors on which nudges rely, the most important of which are social comparison and inertia to change, are particularly prominent with relation to environmental issues.** They are then referred to as 'green nudges' or 'ecological nudges'.

#### **Box 1.**

##### **Nudges to promote healthier eating habits**

Of the numerous fields of application for behavioural strategies, public health campaigning is one of the most well-developed. As an illustration, three nudges were recently tested for the purpose of promoting healthy eating habits. The first nudge involved asking the employees of a company to plan their menus for the whole of the coming month. Viewing the succession of meals as part of a schedule led them to avoid planning the same menu for multiple days in a row and thus to diversify their choices of food. In another example, adding one red crisp at regular intervals between normal chips packaged in cardboard tubes led to a reduction in consumption by 50%. Using these visual markers draws the attention of the eater, gives them points of reference for their own consumption and causes them to interrupt that consumption. Finally, removing the trays for people who eat at the self-service restaurant on a university campus had the immediate result of reducing the portions the students took for themselves and reducing food wastage by an average of 50%<sup>(14)</sup>.

[10] Weber E.U. (2006), "Experience-based and description-based perceptions of long-term risk: why global warming does not scare us (yet)", *Climatic Change*, vol. 77 {1-2}.

[11] Thaler R.H. and Sunstein C.R. (2009), *Nudge: Improving decisions about health, wealth and happiness* Penguin (329p.).

[12] Thaler R.H. and Bernartzi S. (2004), "Save more tomorrow: Using behavioral economics in increase employee savings", *Journal of Political Economy*, vol. 112{1}.

[13] Oullier O. and Sauneron S. (2010), *op. cit.*

[14] For more details on these experiments, see Oullier O., Cialdini R., Thaler R. and Mullainathan S. (2010), "Improving public health prevention with a nudge", in Oullier O. and Sauneron S. (2010), *op. cit.*

## ➤ GREEN NUDGES ALREADY IN ACTION

Certain green nudges have already been trialled abroad (mainly in California, a State famed for its commitment to ecological issues) using various *modi operandi* and with various objectives.

### ( Respecting the environment as the default option

One strategy that is easy to implement and has been proven to be effective is to **offer the most environmentally friendly option as the default choice**. This method relies on inertia to change and the relative laziness of people with regard to adopting an approach that does not come naturally to them.

#### ▶ Paper-saving

Thus, in the USA, some banks, energy suppliers and telephone operators now send bills in electronic format by default. If clients want to receive them in hardcopy, they must specifically ask, and they will be charged for this service. This strategy is interesting when compared with the one implemented in France by the majority of service providers, which requires clients to take action themselves to make sure they no longer receive bills in paper form.

Another illustration is the simple fact of printing two sheets on one page, or printing double-sided as the default option, which meant that American Rutgers University saved over seven million sheets in a single semester, or 620 trees<sup>(15)</sup>.

It should be noted that in France, a similar measure was adopted by a large number of ministries as part of the "Exemplary Administration Plan" launched in early 2009<sup>(16)</sup>.

#### ▶ Reducing the number of plastic bags

The third well-known example is the fact that not providing customers with plastic bags at checkouts obliges them to ask for or even pay for them, as has been the case in China since 2008<sup>(17)</sup> and in Italy since January 1<sup>st</sup>, 2011. This dual obligation constitutes a powerful restriction on overconsumption and encourages people to favour alternative options, such as reusable bags.

For example, the city of Washington DC introduced a tax of 5 cents per plastic bag on January 1<sup>st</sup>, 2010. This measure probably contributed toward reducing the number of bags found in Potomac river by 66% between the annual cleaning operation of 2009 and the 2010 operation. In California, the governor is seeking to go even further, as he is currently advocating a law before Congress aimed at prohibiting the distribution of free plastic bags in shops and taxing the distribution of paper bags.

In France, initiatives along this line depend entirely on the will of distributors<sup>(18)</sup>. In March 2010, the Ministry for Ecology stated that, thanks to the efforts made by shopowners, *"the number of disposable checkout bags distributed in shops went from 10.5 billion in 2002 to 1.6 billion in 2008"*<sup>(19)</sup>. These provisions are effective, as well as being popular, according to recent opinion polls<sup>(20)</sup>, and their positive results are in contrast with the initial scepticism with which the draft law was welcomed<sup>(21)</sup>.

### ( Promoting ecological best practices so they become social norms

Several interventions based on spontaneous adherence to social norms have been launched for various environmental purposes.

[15] Source: Rutgers University.

[16] Circulaire "from the Prime Minister no. 5351/SG of 3 December 2008 on *"the exemplarity of the State with regard to sustainable development in the operation of its departments and its public establishments"*.

[17] For China, this measure has led to a reduction of around 40 billion plastic bags used between 2008 and 2009, representing a saving of 1.6 billion tonnes of oil. Source: Watts J. (2008), "China plastic bag ban 'has saved 1.6m tonnes of oil'", *The Guardian*, 22 May.

[18] The federation of Trade and Distribution Companies signed a convention on November 19, 2009 under which it undertook to remove all disposable checkout bags from distribution by the end of 2011 ([www.fcd.asso.fr/index.php?page=17](http://www.fcd.asso.fr/index.php?page=17)). In December 2010, the French Senate stated that a tax of 10 euros per kilogram of bags would be introduced in 2014.

[19] Source: Ministry for Ecology, Energy and Sustainable Development (2010), *Consommation durable, des engagements aux actes*.

[20] <http://www.nouschangeonsavecvous.com/2010/04/sacs-plastiques/>

[21] Article 47 of the agricultural framework law of January 5, 2006, which prohibited the single-use checkout bags, was held to be in breach of a European directive (see the report on the application of this law: [www.assemblee-nationale.fr/13/rap-info/i0628.asp](http://www.assemblee-nationale.fr/13/rap-info/i0628.asp)).

### ► Recycling waste

On the same principle, researchers carried out a pilot experiment on waste recycling in the town of LaVerne in California<sup>(22)</sup>. Every day for four weeks, a note was placed on the door of 120 homes informing the occupants of the number of their neighbours who participate in domestic waste recycling and the quantity of recycled material that that represents. The impact was immediate: the volume of recycled materials increased by 19%. Furthermore, this effect was durable, as it continued for four weeks after the campaign of placing notes on doors was discontinued. The strength of this strategy lays in providing informational feedback on the behaviour of the neighbourhood, and thus of the social norm applicable in the district. An interesting fact is that the figures mentioned on the printed note were handwritten, thus emphasising the human factor, which is crucial in this type of initiative.

### ► Energy-saving

The area of energy consumption can also benefit from this type of strategy. An experiment carried out in California compared the effectiveness of four messages placed on front doors in an attempt to entice 290 households into using fans rather than air conditioning<sup>(23)</sup>. The first message informed consumers that by adopting such a change, they would save 54 dollars on their monthly electricity bill. The second informed them that doing so would enable them to avoid generating around a two hundred pounds of greenhouse gases every month. The third message highlighted the fact that using fans was the most responsible behaviour, as it consumed the least amount of energy. Finally, the fourth message informed people of the high percentage of neighbouring households using fans rather than air conditioning, a statistic accompanied by the comment: *"the most popular choice in your community"*. The result was that the households receiving this fourth message were the ones that reduced their consumption by the greatest amount – 10% less by their following electricity bill – and the most durably.

### ► Water-saving

Social psychologist Robert Cialdini and his colleagues carried out an experiment that illustrates how the development of more economical behaviours with regard to water can be based on changes made to the minimum cost. Here, the intervention consisted of placing a note in the bathroom of a hotel indicating the percentage of clients who reused their towels instead of having them changed every day. The result was that 44.1% of clients reused their towels, as against 35.1% when the arbitrarily chosen and deliberately high statistic (75%, *Figure 1*) was not communicated to the client<sup>(24)</sup>.

▼ Figure 1.

**Example of an effective encouragement to reuse bath towels in hotels**  
Adapted from Goldstein *et al.*, *op.cit.* ]



[22] Schultz P.W. (1998), "Changing behavior with normative feedback interventions: A field experiment on curbside recycling", *Basic and Applied Social Psychology*, vol. 21{1}.

[23] Nolan J. et al. (2008), "Normative social influence is underdetected", *Personality and social psychology bulletin*, vol. 34.

[24] Goldstein N.J. et al. (2008), "A room with a viewpoint: using social norms to motivate environmental conservation in hotels", *Journal of Consumer Research*, vol. 35{3}.

This statistic concerning the behaviour of others has become a much more effective social norm in terms of encouraging people to reuse towels than the mere appeals to protect the environment traditionally displayed in hotels. However, such a strategy can raise ethical concerns since it relies on providing a percentage of behavioural adoption that does not exist<sup>(25)</sup> in order to help the consumer change his towel reusing behaviour. Some might consider this a form of manipulation that the ends cannot justify.

► **Clean streets**

Moreover, being conscious of social norms does not necessarily involve comparative statistics and can be based on a simple perception of the surrounding reality. For example, a person living in an urban environment in which a large amount of rubbish is encountered on the ground will be more likely to litter themselves. A result such as this, which has been scientifically proven<sup>(26)</sup>, might seem obvious. Its consequences are no less significant for all that. At the city level, for example, a major investment to clean up pavements creates a social norm of cleanliness that is more likely to encourage passers-by to practice ecologically responsible behaviour and can in the long run result in savings on cleaning bills. In addition, this observation promotes the use of communication campaigns setting out the positive consequences of the behaviour they seek to encourage rather than the negative consequences of failing to adopt that behaviour.

➤ **PARTIALLY SURMOUNTABLE LIMITATIONS**

However interesting they might be, strategies based on ecological *nudges* still raise a number of questions.

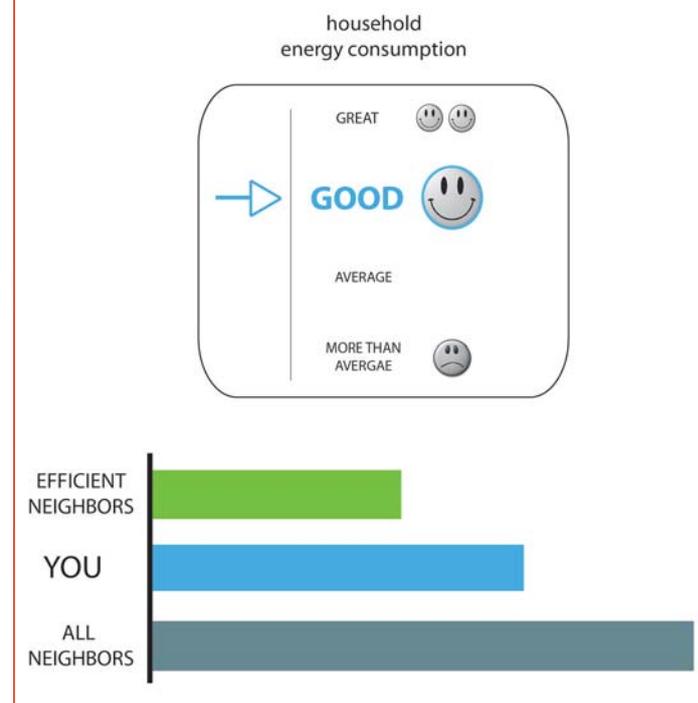
( **The boomerang effect of social norms**

The first is the **adverse effects caused by nudges, which have an impact on comparison weightings**. In fact, social norms work in two directions: they can promote

sensible behaviour on the one hand, but also increase activity that is not environmentally friendly if they are presented and/or perceived as being the behaviour of the majority in any one population.

For example, in an experiment carried out in California, around 1,000 households received data on their energy consumption and that of their local neighbourhood<sup>(27)</sup>. As expected, the comparison of these two sets of information visibly reduced energy consumption in households that initially consumed a lot of energy. More surprisingly, the impact was the opposite in households that used less energy from the start when compared to the average for their area: the green nudge led to an increase in their consumption.

Figure 2. Information added to an energy bill (Adapted from OPOWER<sup>(28)</sup>)



However, this adverse or boomerang effect was avoided by showing initial consumption in the form of a graphic symbol (smiling face or frowning face) on the bill. The

[25] The results of the experiment cannot possibly be provided before the end of the experiment itself.  
 [26] Cialdini R.B. et al. (1990), "A focus theory of normative conduct : recycling the concept of norms to reduce littering in public places", *Journal of Personality and Social Psychology*, vol. 58(6).  
 [27] Schultz P.W. et al. (2007), "The constructive, destructive, and reconstructive power of social norms", *Psychological Science*, vol. 18.  
 [28] The OPOWER company (<http://www.opower.com>) works with the British government on the implementation and evaluation of *nudges* in public policy.

households who “got a smile” reduced their energy bill over subsequent months, irrespective of their original level of consumption (above or below the average) (Figure 2).

We can draw a number of conclusions from these results. A normative message can help people who are less respectful of the environment to adopt more constructive behaviour patterns. On the other hand, for people who already have a pro-environment attitude, this kind of information can make them give up their efforts if it makes them think, “I’m doing better than other people”. However, these undesirable effects can be avoided by using symbols (graphic ones in this case) expressing social approval (the message then becomes positive: “I’m setting a good example”).

Finally, in spite of criticisms of the temporary nature of the effects of ecological nudges, these results lasted for several weeks after the initiative: they are not therefore based, or totally based, on the element of surprise or novelty.

### **Sensitivity to individual characteristics**

It is also often said that nudges are greatly derived from individual personality traits. Effectiveness greatly depends on the initial readiness of individual citizens to follow the recommended direction. In the United States, empirical studies have shown that response to green nudges varies according to the level of altruism in individuals, their support of the ecological cause<sup>(29)</sup> or their political awareness<sup>(30)</sup>.

There are also those who are concerned that behavioural strategies cannot be transposed and still be effective in other cultures. For example, is the influence of comparison with other people as powerful in other societies? Although understandable, this doubt is not borne out

by the results obtained in countries with highly diverse cultures, especially in Asia. For example, a recent study showed that it was more effective to inform a Chinese farmer of the high number of his colleagues who had adopted environmentally friendly agricultural practices than to pay him to do the same<sup>(31)</sup>.

### **The difficulty of transposing initiatives to a bigger scale**

Finally, there is the problem of the general application of these initiatives that, though effective, appear to be limited as regards extending their scope.

Thus, the LaVerne experiment on waste recycling previously referred to was reproduced on the scale of a local community in California, this time providing information on the behaviour of all within the administration. The result was not as conclusive as the experiment conducted at neighbourhood level. In fact, the figures provided were so extensive that they didn’t mean anything concrete to those involved. These results verified the social psychology rule that says that social norms are even more constraining (and effective) when they concern people close to you.

However, encouraging avenues for widening the scope of such good practices are currently under development. Hunt Alcott and Sendhil Mullainathan, among behavioural economists leading lights, have just issued proposals in the journal *Science*<sup>(32)</sup>, for example one involving the use of data mining techniques. The idea is to cross-reference data not directly relating to ecological behaviour (number of children, income, etc.) but that might have an influence on responses to nudges. In this way, they hope to be able to identify homogeneous social groups where comparison, even on a grand scale, will have greater impact.

[29] Schultz P.W. and Zelezny L. [2003], “Reframing environmental messages to be congruent with American values”, *Research in human ecology*, vol. 10[2].

[30] To do this, researchers used electricity bills with or without statistical data on consumption in the local area and advice on saving energy. Initial results from the study published in the summer of 2010 show that the green nudge leads to a 3.1% reduction in electricity consumption amongst Democrats as against only 0.7% amongst Republicans. Costa D.L. and Kahn M.E. [2010], “Energy conservation nudges and environmentalist ideology: Evidence from a randomized residential electricity field experiment”, NBER Working Paper, n°15939.

[31] Chen X. et al. [2009], “Linking social norms to efficient conservation investment in payments for ecosystem services”, *Proceedings of the National Academy of Science USA*, vol. 106[28]. For an example in India, see also Simon S. [2010], “The secret to turning consumers green”, *The Wall Street Journal*, 18 October issue.

[32] Alcott H. and Mullainathan S. [2010], “Behavior and energy policy”, *Science*, vol. 327[5970].

## ➤ WHAT ARE THE PROSPECTS FOR USING BEHAVIOURAL SCIENCES FOR ENVIRONMENTAL ISSUES?

If *nudges* have their limitations, these can still be attenuated where properly identified and anticipated. So using them does open up a number of promising avenues.

### Developing and structuring political and academic initiatives

Overseas, there is now a real desire to structure initiatives spread across a range of ecological *nudges* via coordinated programmes.

With this aim the University of Columbia New York has developed the “Centre for Research on Environmental Decisions” (CRED), bringing together experts in economic and behavioural sciences dedicated to ecological issues. CRED is part of a national and international network of institutions where effort is focused on the psychological bases of environmental protection, funding and conducting laboratory research, field experiments and the publication of guides and articles on the topic<sup>(33)</sup>.

In addition to this, coordination has taken concrete shape in the United Kingdom through the creation of a public structure unique at this time. A *Behavioural Insights Team* was set up in July 2010 within the British Government, headed by Prime Minister David Cameron. This institutional body brings together behavioural scientists tasked with developing, managing and evaluating *nudges* in the sectors of the economy, finance, public health, education and energy. The direct link between the structure and the Prime Minister means experiments can easily be launched rapidly (stand-alone or as partnerships with public and private institutions) and then be evaluated. If they prove to be conclusive, they are then suggested to the authorities in charge of this work for application on a bigger scale. **This type of structure would appear essential in terms of governance**, with a view to transposing the most interesting experiments onto a large scale<sup>(34)</sup>.

In France, it appears to be appropriate to develop measures identified as being the most promising in terms of experience abroad.

1. Draw attention to and praise the sensible behaviour of “neighbours” or members of the same “community” in order to make ecological behaviour a social norm that consumers will adopt spontaneously.
2. Propose energy consumption options by default that are environmentally friendly, and encourage people to engage in a costly procedure, at least in terms of time, if they choose the option that causes the most pollution.
3. Task behavioural science specialists with creating public awareness campaigns.

## PROPOSAL 1

- Encourage people to save energy through the use of utility bills which compare energy consumption.
- Develop default electronic rather than paper communications from public operators.

### Capitalise on the possibilities offered by smart technology

The development of *smart phones* and the applications they offer for the spreading of intelligent electronic networks and *smart meters*, can offer promising perspectives for green nudges.

**There are a number of examples of devices combining smart technology with behavioural strategies.**

- ▶ In 2008, Fiat and Microsoft launched the *Eco:Drive Blue&Me*<sup>(35)</sup> programme. Using a USB port available in all cars the driver can collect a series of data on his journey, fuel consumption, CO<sub>2</sub> emissions, etc. Once the data has been downloaded onto his computer, he

[33] Center for Research in Environmental Decision: <http://cred.columbia.edu>

[34] The British initiative might attract other countries quickly, starting with the United States, where a proposal to develop a sector dedicated to behavioural sciences within the Government's Energy Department has been submitted to Congress [Bill HR 3247]

[35] Source: <http://www.fiat.com/ecodrive/>

has direct access to it and can obtain advice on how to optimise his driving style in order to produce as little pollution as possible. The driver can also log on to a community site to take part in eco-citizen driving contests to measure himself against other drivers.

- ▶ *DIY Kyoto*, a London-based company, is currently developing a web site that will enable everyone with a special unit<sup>(36)</sup> to compare his electricity consumption. Also, the unit has the special feature of being able to change colour instantly in response to energy consumption. This indication given to everyone in real time is an undoubted plus for encouraging behavioural change (*Figure 3*).
- ▶ When plugged in, devices known as *ploggs* are used to record electricity consumption and send it to a computer, where statistics for each appliance in a household can be shown. Based on these tools, the Fraunhofer Institute<sup>(37)</sup> has developed a *smart phone* application that enables the user to view the consumption of an electrical appliance on his screen if he points at it with his phone.
- ▶ In France, ERDF's experimentation with Linky meters offers hope for a number of possibilities<sup>(38)</sup>. In fact, these "smart metering systems" will make it possible to update energy suppliers with information on consumption every half-hour and send the user his exact energy use curve. Also, the meter will ultimately offer the option, via a disconnection relay and a large number of contactors, to control the periodic activation of seven appliances. To do this, based on the same principle as switching on the immersion heater during off-peak hours, users can choose to operate their appliances only at certain times: for example, during hours when renewable energy is usually available.

Figure 3.  
**Electricity sockets showing the consumption of the appliance connected**  
(Adapted from Insic Wall Socket by Muhyeon Kim)



Finally, ERDF's Linky meters will be able to communicate with display panels installed in homes to show real-time consumption. These devices, which could be used with text messaging consumption alert systems, are likely to achieve considerable energy savings. However, as the French Environment and Energy Management Agency<sup>(39)</sup> recently discovered to its cost, the price of such devices (the user pays around fifty euros) could "prevent people on modest income from accessing this information"<sup>(40)</sup>.

So how can we offer these smart devices at a lower cost to all consumers? The cost could be spread across the public electricity network user tariff, with adapted tariffs for people on modest incomes. In other cases, **the State could partially finance the installation of the devices (or totally in the experimental phase)** as per the system set up in California. Over there, electricity suppliers (who have a legal obligation to encourage users to reduce consumption) have received support from a fund (3.4 billion dollars) provided by President Obama to roll out smart meters and associated equipment.

[36] <http://www.diykyoto.com/fr>  
[37] <http://www.ise.fraunhofer.de/about-us>

[38] 300,000 Linky meters are currently being trialled in the Lyon and Tours/Angers regions until 31st March 2011. National rollout across 35 million French households could happen between 2012 and 2017. <http://www.erdfdistribution.fr/Linky>

[39] Agence de l'Environnement et de la Maîtrise de l'Énergie (ADEME).

[40] "ADEME questions use of new smart meter", *Le Monde*, Thursday 11th November 2010 issue.

Due to these various mechanisms, consumers are now actively involved: smart appliances (two-way, real-time, etc.) now provide constant feedback on the effects of their behaviour. French and, in a more general sense, European industries are now way ahead in terms of green smart technologies, and it would appear opportune to use this reserve of expertise to develop public-private partnerships.

## PROPOSAL 2

**Create public-private partnerships to devote the potential of smart technologies for green nudges. For example, a display unit connected to a smart electricity meter could be installed in private homes to give consumers a better realtime feedback of their energy consumption and savings.**

### Encourage everyone to bring creativity and experience to the table

At this point in time, tried and tested nudges are mostly the result of a limited number of academic studies, mainly in the US. It would therefore seem to be a good idea to vary what is available and find as many original strategies as possible to increase overall impact.

So a public competition asking for ideas and developing a website devoted to the topic could produce solutions that are both innovative and pragmatic, being derived from the experience of the consumers themselves.

**CONCLUSION** They may not be miracle solutions to ecological problems, but green nudges are still an interesting approach as an addition to traditional tools of environmental policy (awareness campaigns, education in sustainable development, normative/financial tools, new technology). In fact, *nudges* have the advantage of being operational strategies, which are both effective and adjustable. They also make it easier to adopt new behaviour and go against the recurrent notion associating “environmental action” with “effort”.

However, to be truly effective and more than just anecdotal, the use of *nudges* needs to be incorporated into a consistent environmental policy. One might consider how *nudges* could be associated with tax measures. This could be the appropriate compromise between a desire to raise awareness through the rather “laissez-faire” approach often found in the US, and the more regulatory approach traditionally preferred in France.



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