

Are Voluntary Agreements an Effective Energy Policy Instrument? Insights and Experiences from Europe

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ABSTRACT

In the 1990s there has been a great attention and debate in the European Union and in other OECD countries on the use of voluntary agreements to attain environmental and energy goals. At the time there was a lot of theoretical analysis on this policy instrument and in particular on its effectiveness and cost-effectiveness. However, before the debate was over, a number of important voluntary policy actions were implemented both at the European level, and at national level. These voluntary measures cover equipment (e.g. cars, motors, white goods, etc.), industrial processes, and industrial energy management policies and practices. The paper presents the highlights of the debate on voluntary agreements, reviews and analyses voluntary agreements in the industrial sectors of selected European countries and focuses on some successful European experiences with negotiated agreements for improved energy efficiency of equipment and in the industrial sector, such as the European agreement on consumption of washing machines, the European agreement on power consumption in standby mode of televisions and video cassette recorders (VCRs), the European GreenLight and Motor Challenge Programs. The paper concludes that, if set up under the right institutional framework, voluntary agreements can deliver energy savings in a cost effective manner and could represent an important instrument for climate change mitigation.

Introduction

Voluntary agreements (VAs) include environmental agreements negotiated with industry, public voluntary programs in which firms can choose to participate, and self-regulation. They are increasingly supplementing or replacing other environmental policy instruments, such as regulations, taxes and tradable permits. However, their environmental effectiveness and economic efficiency are often challenged. The term “*voluntary agreement*” (VA) is often used to describe a wide range of industry actions including industry covenants, negotiated agreements, long term agreements, self regulation, codes of conduct, benchmarking and monitoring schemes, and energy management schemes. These approaches differ in relation to their form, legal status, provisions and enforceability (Thalmann & Baranzini 2004). In the present paper the term voluntary agreement is the most generic and encompassing one; specific types of VAs – such as negotiated agreements and long-term agreements – are also defined and discussed in the European context.

The European Commission has in the last decade started to experiment with new tools for environmental policy. The aim is to find comprehensive and flexible mechanisms that put more responsibility on producers, raise environmental awareness in companies and encourage the use of environmental management systems and at the same time leave more leeway for individual solutions that could improve efficiency. Voluntary environmental agreements are currently used at national, regional and local level in all European Member States. The new approach implies,

in particular, a reinforcement of the dialogue with industry and the encouragement, in appropriate circumstances, of voluntary agreements. At EU level (i.e. agreement concluded between the European Commission and a European industry federation) voluntary agreements are still a novelty. Since 1989, only a few agreements have been concluded¹.

Negotiated Agreements in the Industrial Sector

The European Commission distinguishes between “negotiated agreements” (NAs) and unilateral commitments by trade association or individual companies. Negotiated agreements are defined so to highlight the negotiating process between public authorities and industry. This differentiation was necessitated because it was felt that the term “voluntary” was somehow misleading: even if the participation by industry is voluntary, once the agreement has been concluded not only the delivery of the result is no longer voluntary, but also sanctions may be imposed in case of non-compliance. NAs are tailor-made contracts between the regulator and individual firms or groups of firms, which include targets and timetables for action and define rewards and penalties (Thalmann & Baranzini 2004).

For *industry* the motives to enter a NA may be numerous: to actually lower production costs and learn about possibilities, costs and solutions to achieve this, to get exemptions from existing regulations and avoid stricter regulation, to benefit from subsidies or tax rebates, to get green image and strategic advantages, to save on insurance costs and increase their capital market value. Leaving flexibility on options to comply with a given target makes it very likely that least-cost solutions are chosen², especially if agreements are combined with some trading mechanisms, as is the case in the UK (Thalmann & Baranzini 2004).

NAs might present advantages for *public authorities* too: NAs may be more flexible and quicker to implement, easier and quicker to upgrade than legislation allowing them to follow technological evolution and market changes and provide a way to address the information asymmetry between public authorities and firms about the existing technical possibilities for e.g. improving energy efficiency and the costs of implementing these possibilities³ (Menanteau 2001). NAs bring the freedom of adapting the targets and methodology to each industrial sector⁴ and allows tailor-made solutions both for the specific industrial sector and for individual companies within the sector, making possible different timing of energy saving investments for individual companies⁵. In addition NAs can release the burden on public budgets (unless they rely heavily on subsidies and tax waivers).

¹ In the 5th Environmental Action Programme, the European Commission stated that: "whereas previous environmental measures tended to be prescriptive in character with an emphasis on the 'thou shalt not' approach, the new strategy leans more towards a 'let's work together' approach. The 6th Environmental Action Programme also endorses the use of voluntary agreements (<http://europa.eu.int/comm/environment/env-act5/envirpr.htm>).

² While it is uncertain whether the firms that stay out of the NA may have lower costs of compliance, it is very likely that if this is the case, firms will be motivated to enter a NA in order to get the benefits out of it.

³ This asymmetry makes regulation ineffective.

⁴ Each individual industrial branch has its own specific production processes and patterns of energy consumption and the complexity of both the individual production processes and the solutions to improve energy efficiency together with the fact that it is the industry itself that has the best knowledge of the production processes and the technologies required to improve efficiency makes it difficult to design regulation that is built upon ‘real-life’ thorough knowledge of production processes and flexible enough to adapt to the different and specific characteristic of each sector.

⁵ For instance, in the Netherlands, Denmark and Sweden long-term agreements (LTAs, see explanations later) energy

Along with the advantages of the NA approach discussed above, there are also certain risks, the major one being that targets reflect little more than BAU or that targets are not met. To avoid this it is certainly helpful to set general targets (e.g. CO₂ emissions reduction targets) through legislation.

A study on industrial processes (Ecofys et al. 2001) identified the following saving potential options in industry⁶. First, energy efficiency in industrial *core-processes* of energy intensive sectors is difficult to improve because in Europe industry already perceives energy as a high cost factor and therefore there has been always a strong attention to energy consumption in core processes and also because most of the efficiency improvements are linked to investment in new plants. However, there is still a potential to refurbish older and less efficient production plants of energy intensive industries by accelerating the investments and encouraging best practice in the design of new plants. Core processes consume on average about 50% of energy in the process industries. The economic potential⁷ compared to the BAU scenario is about 16 Mtoe (including electricity), or about 60 Mt CO₂. Second, energy efficiency in *non-core areas* of energy intensive sectors of industry, especially in less energy intensive industries and in small and medium enterprises (SMEs) represents a large potential estimated at 15-25 % of total consumption. The saving economic potential compared to the BAU scenario is about 10 Mtoe (including electricity), or about 40 Mt CO₂. These conclusions have been included in the European Climate Change Programme (ECCP) finalised in 2001⁸.

The ECCP working group on energy efficiency in industrial processes concluded that the implementation of a comprehensive energy audit and management scheme particularly focused on the non-core processes that represent about half of energy consumption of industry is the most important measure to foster energy efficiency in industry. Long-Term Agreements (LTAs) were pointed as one of the most efficient instruments in energy intensive industry to improve energy efficiency. In this context LTAs are understood to be a *special type of NAs*, whereby through negotiation between public authorities and industry targets are set to improve *industrial energy efficiency*. The key characteristic of LTAs is that an industry trade association and its members commit themselves to a quantified target for energy efficiency improvement by a specific year relative to a reference year⁹. Two approaches towards LTAs exist in Europe:

1. The “*mandatory*” approach: countries with (existing) CO₂/energy tax schemes are using LTAs to justify tax exemptions for energy intensive industry. A typical example is the Danish, Swedish or the UK case. The LTA scheme in the Netherlands offered industry an easier access to environmental permits;

efficiency improvements do not have to be distributed equally among a company's various sites, but the company has to carry out the measures indicated in the energy efficiency plan and has to contribute to meet the sector's target.

⁶The saving potentials are only associated with to the energy efficiency improvements of industrial process.

⁷The economic potential is defined as the potential savings that can be achieved at a net positive economic effect, i.e. the energy savings resulting from the action are higher than the measure/investment cost (including interest, depreciation, and operation and maintenance cost).

⁸ For more information, see <http://europa.eu.int/comm/environment/climat/eccp.htm>

⁹ The LTA concept was first introduced in the Netherlands, and then used in European energy efficiency policy to indicate agreements between public authorities and industrial branches to improve energy efficiency in industrial processes. In 1997 following discussions between the Dutch authorities and the European Commission it was investigated to extend the Dutch concept to the whole European Union.

2. The “*voluntary*” approach: countries with existing energy audit programs or similar schemes can use LTAs to design a visible and more flexible and effective framework to achieve environmental targets. This is the case in Finland.

In reality these approaches often appear in combination. “Mandatory” approaches were so far limited to national initiatives, but for the “voluntary” one there are also examples at the EU level, e.g. the CEFIC Voluntary Energy Efficiency Programme (VEEP). This is a unilateral commitment to improve energy efficiency by 20% between 1990 and 2005 in the chemical sector.

The main characteristic of the LTA is that it is a target-based instrument. An effective LTA should promote energy efficiency beyond the BAU scenario and should aim at least at the economic potential for energy efficiency improvement. In-depth analysis of the possible efficiency measures allows public authorities to negotiate targets with industry that are ambitious and go beyond BAU. For example, commonly used criteria for establishing the efficiency targets is to identify all opportunities for efficiency improvements with an acceptable pay-back period (PBP) or the benchmark process efficiency. To evaluate the effectiveness of LTAs in improving energy efficiency, it is important to determine the level of the quantified target compared to the efficiency improvement that would in any case take place under BAU scenario. As the definition of the BAU might be complex, in some cases it might be more appropriate to compare the energy efficiency target (e.g. 20 % improvement in 10 years) with the *historical trend*.

LTAs should be designed to achieve the efficiency improvement in a cost-effective manner. In doing so it is important that, besides the energy/environmental (and economic) benefits, all the costs both to industry and public authorities are evaluated beforehand and compared with other possible policy instruments. In particular public authorities should evaluate the transaction costs, which could be considerable especially in industry sectors with several actors or with poorly organised trade associations (Bertoldi & Starzer 2003).

The European Commission has been working on the promotion of the LTA instrument and in the creation of a possible harmonised LTA framework (EC 2000); the work is based on the checklist presented in the Commission Communication on Environmental Agreements (EC 1996) with the following essential elements: objective, **quantified targets**, **monitoring and reporting** mechanisms, and **obligations**. It adds some new requirements specific to LTAs such as the **energy conservation plan**, and the **communication plan**.

European Union Member States’ Experience with Voluntary Agreements in Industry Branches

The following sections describe and analyse a selection of agreements in some European countries. The review shows the wide variety of options for voluntary agreements to be implemented and fitted in the context of a national climate and energy policy mix.

The Netherlands

In the Netherlands, 31 agreements were concluded between the government and industry branches by the end of the 1990s. Each agreement is a contract under civil law signed by the government, individual companies and the trade association. Agreements are **legally binding**; by agreeing to additional efforts industry gets facilitated access to environmental permits (Starzer 2001). Industry is exempt from the carbon tax introduced in 1996 and NAs are the sole

instrument for climate change mitigation in the industrial sector. NAs cover all industrial branches (the minimum industrial branch coverage for an agreement to be valid is 80 %) and some services (banking, airlines). They explicitly include **individual firm commitments** and mandatory reporting at firm level (Chidiak 1999). Non-compliance brings companies back under the standard operation permit system. A report from the Dutch Ministry of Economic Affairs has indicated that the Dutch agreements are to deliver 2 % per annum efficiency improvement in the period 1990-2000 (Starzer 2001). The Dutch authorities have discussed with industry annual efficiency improvement target of 2.2 % for the period 2000-2010.

Recently the Netherlands has introduced a follow up LTA: the Covenant on Benchmarking Energy Efficiency, under which companies commit to achieve best of the class energy efficiency of process installations amongst comparable companies. The top energy efficiency level is specified as having 90 % of the best installation or at least 10% less energy efficient than the best performing installation. The companies commit to take action as soon as possible, but at ultimately 2012. The implementation is envisaged to begin 2006; benchmarked companies that are not yet among the best in the world, will have to take all energy conservation measures that generate enough savings to cover the costs of borrowed capital. If a company is not in the world top class in 2008 it can choose between taking additional energy efficiency measures or finding trade offs through the Kyoto Mechanisms.

Germany

In March 1996, The Federal association of German Industry (BDI) published a “Joint Declaration of the German Industry on Climate Protection” together with five other trade and industry associations, stating their intention to reduce specific CO₂ emissions or their specific energy consumption by 20 % in the period up to 2005, taking as base year 1990. The agreements cover over 71% of industrial energy consumption in Germany and more than 99% of public power generation. This was linked to a postponement of the introduction of energy taxation. The declaration is not legally binding. An overall target for industry and branch specific goals were set, but no commitments for individual firms, which makes it unclear how branch targets add up to the total and how overlapping of branches due to intermediate production is treated (Chidiak 1999). Unlike in other countries, in Germany the agreement contains declarations of the four associations of the energy supply sector with announced measures to increase the efficiency of power generation and distribution and undertake DSM activities (Ramesohl & Kristof 1999).

The first report was issued in 1997, indicating that the industry was delivering what was promised. However, there is some controversy on the real “additional” efforts with concerns that the targets for 2005 were already achieved in 1995-1996, when the declaration was issued; besides the technical improvements in West Germany, structural changes in East Germany after the unification contributed to the achievement of targets (Ramesohl & Kristof 1999).

In year 2000 the BDI renewed its commitment to continue making particular efforts to reduce its specific CO₂ emissions as well as other GHG emissions. German business renewed its commitment to reduce the specific emissions of all six Kyoto GHGs by 35% by 2012 compared to 1990 levels. In connection with this, BDI agreed to make additional efforts to achieve a specific reduction in CO₂ of 28 % as compared to 1990. However with the entry into force of the EU Emission Trading System (ETS) in January 2005, there seems to be less interest on the voluntary commitment by industry and the public authorities, since GHG reductions will be achieved by action under the EU ETS (Ramesohl 2005).

Finland

The Ministry of Trade and Industry and the Confederation of Finnish Industry and Employers concluded a VA on the Promotion of Energy Conservation in Industry in November 1997. The energy conservation agreements, which remain in force until 2005, are framework agreements whereby branch associations undertake to further energy conservation and recruitment of their members to the energy conservation agreement. Companies entering the agreement undertake to carry out energy audits or analyses in their own properties and production plants, to draw up an energy conservation plan, and to implement cost-effective conservation measures. The Ministry of Trade and Industry undertakes to subsidise energy audits and analyses, as well as energy conservation investments fulfilling certain criteria. The aim of the agreement is to reduce the specific consumption of energy and to develop and introduce actions, which would allow energy efficiency to become an integral part of companies' operations.

The agreement was well received by industry and the system covered in year 2004 over 85 % of all energy used in Finnish industry (Motiva 2005). In 2001, an interim assessment of the industrial and energy sector agreement was carried out giving mainly positive feedback (Motiva 2005). The recently completed assessment (January 2005) reported that the energy scheme appeared to have functioned rather well in terms of meeting the overall target, the coverage of the agreements, attainment of agreed targets and opinions of agreement parties. Overall, the results obtained through the conservation agreement scheme are significant with a positive cost/benefit ratio.

Sweden

The first Swedish VA program for efficient energy use in industrial companies was called EKO Energy scheme (1995-2003). It was setting a list of prerequisites (performance and management standards for energy efficiency according to EMAS) to be satisfied by participants, who in return received a subsidy covering the cost of the energy audit and a logo (Chidiak 1999). Swedish industry was exempt from the carbon tax introduced in the early 1990s. Due to EU tax harmonisation this tax exemption was suspended in 2004.

A new VA program for energy-intensive industry called Programme for Energy Efficiency was launched in January 2005. The program is based on 5-year agreements between individual companies and the National Energy Agency (STEM). To be eligible to sign an agreement the individual company has to implement an accredited energy management system, carry out an energy audit and implement all identified measures with a payback period less than 3 years. The scheme also includes requirements of the individual company to implement certain routines for energy-efficient purchasing and maintenance. In return the company receives exemption of tax on process related electricity consumption. Non-compliance means loss of tax reduction (Persson & Gudbjerg 2005).

Denmark

In Denmark VAs with energy intensive industry branches are binding and are connected to the CO₂ tax. Between late 1980s and late 1990s, 16 agreements have been concluded related to energy and environmental issues. Agreements focused on energy supply and were concluded between government and power companies. Companies from the heavy industry (highly energy

intensive firms) commit themselves to energy-saving investments in return for a reduced tax rate; tax rates of the carbon tax introduced in 1993 have been increasing¹⁰ in time, which motivates companies to enter into agreements. Also other companies with an energy tax liability of more than 3 % of the added value may enter into this kind of agreement. Heavy-process companies joining are required to undertake any investment with a payback period of less than 4 years (for other companies 6 years or less). Requirements are standard and pre-defined for each participant and the focus is on energy management rather than on goals (Chidiak 1999). Non-compliance means loss of tax rebates. Between 1996 and 2002 more than 400 agreements have been made with companies, covering approx. 60 % of trade and industrial energy consumption (Persson & Gudbjerg 2005). Denmark is the only country that has **evaluated that total effect of the scheme**: the estimated CO₂ reduction in 2005 as a consequence of agreements over the period 1996-2000 is 6.3 % of total emissions and 2.7 % of the energy consumption of manufacturing industry (Persson & Gudbjerg 2005).

United Kingdom

In 1997 the government reached an agreement with the chemical industry: the sector committed to a 20 % CO₂ emission reduction by 2005 compared to 1990. In 2001 the UK launched NAs to reduce GHG emissions in the energy-intensive sectors. These agreements are part of a comprehensive policy, the UK Climate Change Programme presented in 2000. The overall programme plans to reduce GHG emissions by 23 % in 2010 compared to 1990 levels with industry contributing no less than 50% of the total expected reductions (in 2000 industry contributes 20 % of total emissions). A peculiarity of the UK programme is the use of a broad range of policy instruments: market-based instruments (energy tax, emission trading, auctions), command and control regulations (minimum renewable energy use requirement, energy efficiency objectives) and negotiated agreements. Agreements essentially consist in quantitative objectives of energy use reduction to be met by 2010.

By mid-2004, 44 trade associations have signed a Climate Change Levy Agreement (CCLA) covering the emissions of more than 10,000 industrial sites. As their name suggests, these agreements are intimately linked with a tax launched in April 2001: the Climate Change Levy. By signing a CCLA the participating firms receive a 80% tax rebate (de Muizon & Glachant 2004). Participants in CCLA can use the UK Emission Trading Scheme to buy and sell allowances.

France

In 1971 France signed the first VA in Europe. In the second part of the 90s seven non-binding agreements were signed with energy intensive branches (both at firm- and branch-level). The driving force for industry to get involved in the process was the threat of the imposition of a CO₂ tax (Starzer 2001 and references herein). Measures to be undertaken are not specified and there is no non-compliance penalty (Chidiak 1999). In 2001 French companies responsible for about a fifth of French greenhouse gas emissions signed up to a VA to reduce these emissions by 14 % by 2007 compared with 1990 levels. The agreement involves 21 multinational firms and three energy producers comes a year after industry agreed the broad outlines of a voluntary

¹⁰ The level of taxation depends on the energy type and the purpose of energy use; energy intensive companies are protected from the impact of the full tax.

agreement, heading off any government attempts to impose a compulsory industry target. Manufacturing firms have committed to the largest targets - a 27% overall cut in emissions by 2007, with the chemical companies involved agreeing to 40 %. By contrast, the three energy producers say they can only cut emissions by 2.5%.

Negotiated Agreements with Product Manufacturers

During the discussions leading to the adoption of the minimum efficiency standard for refrigerators and freezers several stakeholders insisted on the use of more flexible instruments, in particular NAs, with manufacturers to reach energy efficiency improvement comparable to the one achieved with legislation. European appliance manufacturers have indicated their strong opposition to regulatory approaches. Manufacturers expressed their willingness to reach NAs to achieve energy savings where a target average efficiency is agreed. According to manufacturers, this would give them more freedom in reaching the target, by selling more high efficiency products, by having flexibility when to phase out low efficiency units and therefore optimize the process. Manufacturers have highlighted the advantages of having a demand driven process, which would favor cost-effective solutions and allow manufacturers to have a pro-active role in setting quantified criteria and in implementing the measures (Bertoldi 2001).

The European Commission considers that NAs can be a valid alternative to the introduction of legislation for mandatory minimum energy performance standards (MEPS) for equipment, if they include the four essential elements. First, **quantified commitments/targets** by manufacturers for significant improvements in the energy efficiencies of the equipment produced over a reasonable time-scale. Second, commitments by manufacturers **accounting for most of the equipment sold** at the EU market (80% at least). Third, an **effective monitoring** scheme with some degree of independence to monitor the energy efficiency improvements achieved. Finally, **sanctions** or mechanisms to discourage non-compliance, such as mechanisms to ensure loss of public image for the non-compliant company (e.g. press announcement by public authority), loss of tax benefits, or credible threat to introduce legislation. It also is essential that NAs are in conformity with the rules of the EU treaties¹¹. The risk of “free-riding” must be carefully assessed. In particular, the number of appliances imported into the EU must be assessed as usually only EU-based manufacturers member of the EU trade association are likely to enter into the NA process.

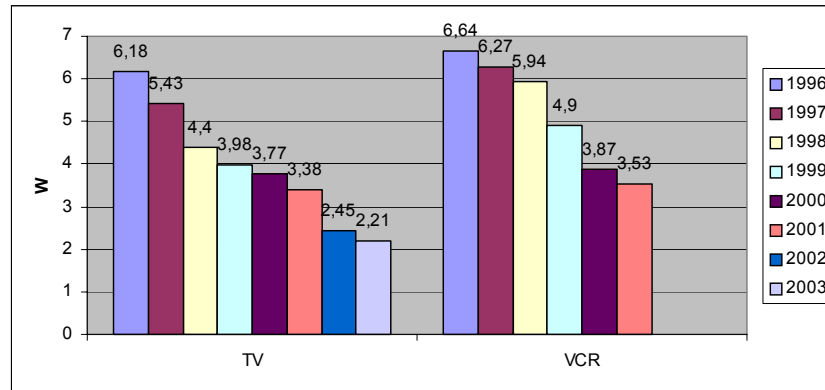
A number of NAs have been concluded between the Commission and EU manufacturers associations, which have pre-empted the need to propose or introduce specific legislation for efficiency requirements for this equipment. In the recent past, agreements have been implemented as unilateral commitments by industry: on stand-by losses of TVs and VCRs, cloth washers, dishwashers, electric motors, electric water heaters (Bertoldi 2001). Three of these are discussed below.

The **TVs and VCRs** agreement was signed in 1997 by 16 companies and notified to the competition authorities. Manufacturers agreed that the company sales-weighted average would be progressively reduced towards 3W by 2009. The target refers to the company *sales-weighted* TVs and VCRs stand-by consumption. During 2003, sale average power consumption of 2.21 W

¹¹ In practice any form of co-operation has to be done in respect of Article 85 of the EU Treaty, which rules out anti-competitive practices. To this end NAs have to be notified to the EU competition authorities before they enter into force.

and 3.53 W was achieved for TVs and VCRs respectively. Figure 1 shows evolution in stand-by consumption (EC 2004).

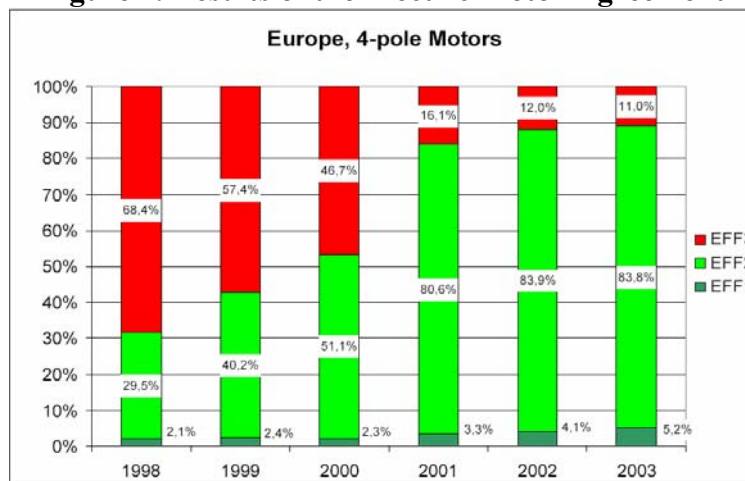
Figure 1. Results of the TV and VCR agreement



The **cloth washer** NA was concluded in 1998; it included the phasing out of low efficiency models as well a 20 % overall efficiency improvement. It is important to note that unlike in the case of TVs and VCRs *there is no company-specific energy efficiency target*. As a result of the NA the energy efficiency index (measured in kWh/kg) has dropped from 0.249 in 1996 to 0.208 in 2002. (EC 2004).

Figure 2 summarizes the results of the electric motor agreement coupled with the voluntary labelling scheme. The motor agreement was based on a new system of efficiency designation for **electric motors** developed by the motor manufacturers' association (Bertoldi 2002). The agreement has been to reduce the market share of motors in the lower efficiency class. By 2003 it represented only 11 % of the market (EC 2004).

Figure 2. Results of the Electric Motor Agreement



Given the results of the NAs described above, new self-commitments have been implemented on improving the energy efficiency of TVs in on-mode and a new agreement on refrigerators in 2004. The new draft European Framework Directive on Eco-Design foresees the use of agreements as a valid alternative to legislation.

European Voluntary Programmes

To convince end-users to adopt efficient lighting technologies and systems and achieve a long lasting market transformation, the European Commission launched in 2000 the European **GreenLight programme** (more info available at <http://www.eu-greenlight.org/>). It is an on-going voluntary programme whereby private and public organisations commit to adopting energy-efficient lighting measures when the cost of these measures is repaid by the associated savings and lighting quality is maintained or improved. GreenLight partners report annually on their achievements within the programme. So far, GreenLight has gathered more than 210 public and private organisations. Several lessons have been learned from the GreenLight process: often energy savings alone do not constitute a sufficient reason for companies to join and public recognition benefits have proven to be an additional argument in the upgrading process; GreenLight Partners need a user-friendly lighting audit procedure which they can easily follow to quickly identify which spaces can be upgraded and which cost effective measures can be applied (Bertoldi & Ciugudeanu 2005); as the final decisions are taken at high levels the information presented needs to be compact simple and based on economic terms. Over 1000 buildings have been upgraded in the GreenLight programme (schools, offices, airports, supermarkets, warehouses and production facilities, etc.). Some industrial companies have started with energy efficiency actions in lighting and following the results have then moved on to invest in energy efficiency in other equipment and systems (e.g. motor systems).

The European **Motor Challenge Programme**¹² is an initiative of the European Commission to aid industrial companies in improving the energy efficiency of their electric motor driven systems. It focuses on compressed air, fan and pump systems, for a large technical and economic potential for energy savings has been demonstrated. Companies that use motor driven systems can request 'Partner' status; companies that supply motor driven systems may become 'Endorsers'. The core of the programme is an Action Plan, by which a Partner commits to undertaking specific measures to reduce energy consumption. The Partner company determines which production sites, and which types of systems, are covered by the commitment .

Two other important voluntary initiatives have been launched in 2004: the new **GreenBuilding Programme** (more info available at <http://energyefficiency.jrc.cec.eu.int/greenbuilding/index.htm>), which extend the GreenLight to other buildings loads and to the optimisation of the whole building, and new specific *Guidelines for energy efficiency in small and medium size enterprises in the Eco-Management and Audit Scheme (EMAS)*¹³ .

Conclusion

The paper has summarized the highlights of the European debate on VAs for energy efficiency, and provided an overview of different types of VAs for the industrial sector in some European countries (negotiated agreements, long-term agreements, public voluntary programs and some supranational initiatives) and of NAs with equipment manufacturers. The review of experiences in Europe shows that VAs are very different in nature: unilateral, bilateral, legally binding or not, concluded by a trade association or individual companies. VAs have different

¹² More information available at <http://energyefficiency.jrc.cec.eu.int/motorchallenge/index.htm>

¹³ EMAS is the EU voluntary scheme for organisations willing to commit themselves to evaluate, improve and report on their environmental performances. The scheme was launched in April 1995 and revised in 2001. More information can be found at http://europa.eu.int/comm/environment/emas/index_en.htm.

coverage (produced good or own consumption, which may be confined to the core process or the overall consumption), and by type of commitment (from branch-level objectives to detailed indication of measures to be undertaken by each firm).

NAs have demonstrated to have a number of positive features vis-à-vis equivalent legislation: NAs are much faster to introduce and involve lower administrative costs (Bertoldi 2001), they offer greater flexibility in the choice of the targets, which can be defined in terms of maximum consumption limit or fleet levels, and allow the inclusion of soft targets, which might result in worthwhile additional savings. In addition greater co-operation by manufacturers and their proactive role in defining feasible and effective efficiency targets is ensured.

In summary: VAs in Europe have worked as an alternative to regulation (efficiency targets, standards, taxation, etc.) for products and industrial energy consumption. A few crucial elements should be kept in mind, namely transparent preparation and negotiation of rules and targets, ambitious but reachable targets, monitoring and evaluation mechanism (perhaps even more effective than in the case of legislation) followed via third party verification with reporting made public and non-compliance sanctions. In addition accompanying measures (free audit, technical assistance, help in R&D, financing for implementation, etc.) facilitate such agreements. VAs can deliver energy savings in a cost effective manner (Bjørner 2004, Thalmann & Baranzini 2004, Persson & Gudbjerg 2005), if set up under the right institutional framework whose essential elements have been discussed in this paper. They could represent an important instrument for climate change mitigation. The EU ETS will have a strong interaction with the VA, and perhaps replace or downplay VAs in the sectors under obligation. In existing VAs and planned VAs the impact and integration of EU ETS should be taken into account.

References

- Bertoldi, P. 1999. "The Use of Long Term Agreements to Improve Energy Efficiency in the Industrial Sector: Overview of the European Experiences and Proposal for a Common Framework". In *Proceedings of the American Council for Energy Efficient Economy (ACEEE) summer study*. Washington, D.C.: ACEEE.
- . 2001. "Assessing the Market Transformation for Domestic Appliances Resulting from European Union Policies". *Proceedings of the European Council for Energy Efficient Economy (ECEEE) summer study*. Stockholm: ECEEE.
- . 2002. "European Policies and Programmes to Improve Energy Efficiency of Motor Systems", In *Proceedings of the 3rd International Conference on Energy Efficiency in Motor Driven Systems* (Treviso, 18-20 September 2002). Heidelberg: Springer.
- Bertoldi, P. and O. Starzer. 2003. "Combining Long Term Agreements with Emissions Trading: An overview of the current EU energy efficiency policies for the industrial sector and a proposal for a new industrial efficiency policy". In *Proceedings of the American Council for Energy Efficient Economy (ACEEE) summer study*. Washington, D.C.: ACEEE.
- Bertoldi P and C. Ciugudeanu. 2005: "Five-year assessment of the European GreenLight programme". In *Proceedings of the Right Light 6 Conference*, Shanghai.
- Bjørner, T. B. 2004. "An Empirical Analysis of the Effect of the Danish Energy Agreements". In Baranzini, A. and P. Thalmann (ed.) *"Voluntary Approaches to Climate Protection. An economic assessment of private-public partnership"*. Cheltenham: Edward Elgar.

- Chidiak, M. 1999. "Voluntary agreements for energy efficiency in five EU countries". *Proceedings of the European Council for Energy Efficient Economy (ECEEE) summer study*. Stockholm: ECEEE.
- de Muizon G. and M. Glachant, M. 2004 "The UK Climate Change Levy Agreements: Combining negotiated agreements with tax and emission trading". In Baranzini, A. and P. Thalmann (ed.) *"Voluntary Approaches to Climate Protection. An economic assessment of private-public partnership"*. Cheltenham: Edward Elgar.
- Ecofys, AEA Technology Environment, National Technical University of Athens. 2001. *Economic Evaluation of Sectoral Emission Reduction Objectives for Climate Change. Study for DG Environment*
- EC, European Commission. 1996. Communication on environmental agreements COM(96) 561.
- . 2000. Action Plan to Improve Energy Efficiency in the European Community COM(2000) 247.
- . 2002. Communication on Environmental Agreements at Community Level Within the Framework of the Action Plan on the Simplification and Improvement of the Regulatory Environment COM (2002) 412)
- . 2004. *Energy End-Use Efficiency and Electricity from Biomass, Wind and Photovoltaic in the European Union*, Ispra, ISBN 92-894-9193-5.
- Menanteau, P. 2001. "Are voluntary agreements an alternative policy to efficiency standards for transforming the electrical appliances market". *Proceedings of the European Council for Energy Efficient Economy (ECEEE) summer study*. Stockholm: ECEEE.
- Motiva. 2005 "Energy conservation agreements - Progress review 2004", Helsinki.
- Persson, A. and E. Gudbjerg, E. 2005. "Do voluntary agreements deliver? Experiences from Energy Management Systems and schemes". In *Proceedings of the European Council for Energy Efficient Economy (ECEEE) summer study*. Stockholm: ECEEE.
- Ramesohl, S. and K. Kristof. 1999. "What is the role of energy-related voluntary approaches in post-Kyoto climate policy? A process oriented analysis of the "Declaration of German Industry on Global Warming Prevention". In: *Proceedings of the American Council for Energy Efficient Economy (ACEEE) summer study*. Washington, D.C.: ACEEE.
- Ramesohl, S. 2005. Personal communication 28 April.
- Thalmann, P. and A. Baranzini. "An overview of the economics of voluntary approaches in climate policies. In Baranzini, A. and P. Thalmann (ed.) *"Voluntary Approaches to Climate Protection. An economic assessment of private-public partnership"*. Cheltenham: Edward Elgar.
- Starzer, O. 2001. "Towards Kyoto – implementation of Long-Term Agreements (LTAs) in industry: which elements make LTA successful and how to integrate them into the policy mix". *Proceedings of the European Council for Energy Efficient Economy (ECEEE) summer stud*. Stockholm: ECEEE.