

# LESSONS LEARNED: TRANSFERRING THE EUROPEAN UNION’S EXPERIENCES WITH ENERGY EFFICIENCY POLICY TO CHINA

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## INTRODUCTION

As signs of climate change increase and fossil fuel sources of energy rise in long-term price and scarcity, countries are paying ever more attention to the intersections that exist between energy and environmental policy. China's energy/environmental crisis in particular has received major international attention recently, as China's continued growth positions it as a key player in solving the climate change and energy supply crises of the present and future. A November 2007 article in *The New York Times* series "Choking on Growth: A series of articles and multimedia examining the human toll, global impact and political challenge of China's epic pollution crisis" detailed China's "energy conundrum" as a "no-win situation."<sup>1</sup> China is faced with bad and

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<sup>1</sup> Jim Yardley, *At Chinese Dams, Problems Rise with Water*, N.Y. TIMES,

worse choices between building huge hydropower dams displacing millions of people or adding more dirty coal-fired power plants to meet its burgeoning energy demand.<sup>2</sup> In the face of these unappealing choices, one solution stands out as almost incontrovertibly good: increasing energy efficiency as an alternative to increasing energy supply. In addition to addressing supply challenges, a robust energy efficiency policy brings energy security, reduced emissions, cost-effectiveness, economic competitiveness, local job creation, and sustainability.<sup>3</sup>

The European Union (EU) has been at the vanguard of passing forward-thinking energy efficiency policies over the past two decades, although it is still grappling with achieving full implementation of these policies. More recently, China has also been active in making energy efficiency a part of its national energy strategy. However, China has struggled to craft effective energy efficiency laws and to achieve implementation of these laws throughout the country. If successful, the potential for improvements and energy savings in China is tremendous. China has begun to decouple its GDP and its growth in energy consumption over the past twenty years,<sup>4</sup> but it still uses five times as much energy as the EU to produce one unit of GDP because its gains in energy efficiency have not kept pace with its rapid growth.<sup>5</sup> This inefficiency, coupled with the massive continued

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Nov. 19, 2007, at A1 (quoting Jonathan Sinton, China program manager at the International Energy Agency).

<sup>2</sup> See *id.*

<sup>3</sup> Commission of the European Communities, *Impact Assessment Report for the Action Plan for Energy Efficiency 3* (Commission Staff Working Document 2006) [hereinafter *Working Document for Action Plan*], available at [http://ec.europa.eu/energy/action\\_plan\\_energy\\_efficiency/doc/impact\\_assessment\\_report\\_en.pdf](http://ec.europa.eu/energy/action_plan_energy_efficiency/doc/impact_assessment_report_en.pdf); European Commission, *Mobilising Public and Private Finance Towards Global Access to Climate-friendly, Affordable and Secure Energy Services: The Global Energy Efficiency and Renewable Energy Fund*, at 3, COM (2006) 583 final (Oct. 6, 2006). See also MCKINSEY & CO., *REDUCING U.S. GREENHOUSE GAS EMISSIONS: HOW MUCH AT WHAT COST?* xiv (2007) (recognizing energy efficiency as the most cost-effective (actually as a negative-cost) option for emissions reductions in the United States).

<sup>4</sup> China's GDP averaged 9.7 percent growth per year while energy consumption rose 4.6 percent per year from 1980 to 2000. Michael B. Cummings, *Helping the Dragon Leapfrog: A Survey of Chinese Energy Policy and U.S. Energy Diplomacy at the Crossroads*, 36 ENVTL. L. REP. 10526, 10527 (2006) (citing DEVELOPMENT RESEARCH CENTER OF THE STATE COUNCIL, *CHINA'S NATIONAL ENERGY STRATEGY AND POLICY 2000–2020*, at 3 (2003)).

<sup>5</sup> European Commission, *Green Paper on Energy Efficiency*, at 6, COM (2005) 265 final (June 22, 2005) [hereinafter *Green Paper*]. See also Justin

growth projected for China in the coming decades, creates opportunities to save (or waste) vast amounts of energy, depending on the extent to which China can implement effective energy efficiency policies.<sup>6</sup> The Chinese government has made considerable progress in enacting new energy policies and in showing awareness of the energy challenges it faces. However, most commentators express doubt in the central government's ability to implement and follow through on its stated policy goals.<sup>7</sup> Experts identify implementation and enforcement of existing laws, as well as creating better incentives for investment in energy efficiency, as key goals for making energy efficiency a successful part of China's energy future.<sup>8</sup>

This note seeks to detail the key strategies that the EU has adopted in the field of energy efficiency, and then to draw lessons from the EU's experience that might be helpful as China moves forward in implementing its own energy efficiency policy. While the EU still has far to go in achieving its energy efficiency potential, its fifteen years of experience in crafting and implementing energy efficiency laws offer some valuable insights from its successes and persisting challenges. The EU is the focus of this note not only because of its leadership and voluminous activity in the field of energy efficiency, but also because its governmental structure parallels China's in some instructive ways.

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Blood, Note, *Energy Production Pollution in China—The Effectiveness of Two Forms of Chinese Governmental Response to the Problem*, 19 COLO. J. INT'L ENVTL. L. & POL'Y 155, 156 (2007). China also lags considerably behind the U.S. in reducing its energy intensity; the U.S. Energy Information Administration's 2008 analysis shows that China uses approximately four times more energy than the U.S.—whereas the U.S. used 8841 btu/2000 U.S. dollars in 2006, China used 34,931 btu/2000 U.S. dollars (measured by market exchange rates). See Energy Information Administration, World Energy Intensity (2008), <http://www.eia.doe.gov/pub/international/iealf/tablee1g.xls>.

<sup>6</sup> See, e.g., Cummings, *supra* note 4, at 10531.

<sup>7</sup> See, e.g., *id.* at 10545; Wang Mingyuan, *Issues Related to the Implementation of China's Energy Law: Analysis of the Energy Conservation Law and the Renewable Energy Law as Examples*, 8 VT. J. ENVTL. L. 225, 228 (2007); Wang Qingyi, *Energy Conservation as Security*, CHINA SECURITY, Summer 2006, at 89, 96–97.

<sup>8</sup> See, e.g., Cummings, *supra* note 4, at 10545; Srinivasan, *Regulating the Belching Dragon: Rule of Law, Politics of Enforcement, and Pollution Prevention in Post-Mao Industrial China*, 18 COLO. J. INT'L ENVTL. L. & POL'Y 267, 309–11 (explaining that one of China's critical challenges is that while the national government sets environmental policy, the local governments are often unwilling to implement, enforce, and finance these policies).

That is, the EU's supranational government oversees an incredibly diverse range of EU member states, each with national governments that diverge in priorities and capabilities. Similarly, China's national government works with a diverse range of provincial governments that are in charge of much of the day-to-day implementation of national laws and policies. Thus, the lessons learned from the EU's struggles with balancing responsibilities between levels of government may help China in its similar effort. Ideally, this will help "the Dragon [I]eap-frog" some of the EU's energy efficiency challenges, a strategy that Michael Cummings recently suggested will be critical to China's success in this area.<sup>9</sup>

This note focuses on three of the critical challenges facing China that have also been major components of the EU's energy efficiency policy development: implementation, enforcement, and financing. Part I of the note provides an overview of EU energy efficiency law and policy. It first summarizes the EU's lawmaking institutions and capabilities, and then briefly highlights key aspects of EU energy efficiency law in each of the major sectors (end-use electricity, buildings, household appliances and energy-using products, and industry). Finally, it summarizes some of the EU's key goals for future energy efficiency policy. This overview explicitly focuses on regulation of the electricity sector as opposed to the transport sector, simply for the purpose of limiting its scope to a manageable size.<sup>10</sup> Part II describes the EU's process, progress, and challenges in the implementation of these laws, and Part III describes the enforcement mechanisms used to achieve greater implementation. Part IV outlines the major financing tools that the EU uses to incentivize the adoption of cost-effective

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<sup>9</sup> See Cummings, *supra* note 4, at 10531 ("Perhaps as equally important [as China's energy law and policy development] will be the policies of other countries—especially the EU, Japan, and the United States as they relate to cleaner energy technologies—in helping to shape this [China's development] trajectory.").

<sup>10</sup> Energy efficiency in transport is another important goal in both the EU and China; further research analyzing transferable lessons in this sector would be worthwhile. But at least one expert has suggested that the appropriate policies for the transport sector might be somewhat easier to implement, and that "more problematic for China, the region, and the world is the rapid near-term development of the Chinese electricity sector." Cummings, *supra* note 4, at 10534. Hopefully, many of the lessons in implementation and enforcement gleaned in this paper will be transferable to the field of transport energy efficiency though the laws themselves are not covered in detail here.

energy efficiency measures. Finally, Part V draws on the similarities and differences between the EU and China to suggest some ways in which Chinese policy-makers could adapt the lessons learned from the European energy efficiency experience to help in the crafting, implementation, enforcement, and financing of China's own energy efficiency policy.

While this note's conclusions are focused on lessons that China could draw from EU energy efficiency policy, its analysis of the EU's experience offers insights applicable to other developed and developing countries as well. By contextualizing and focusing primarily on the EU's successes and struggles with energy efficiency, and then drawing some broad lessons that could assist China's particular situation, this note might lend ideas to policy-makers in myriad other countries. These policy-makers can and should evaluate the EU's experience and potentially applicable lessons in the context of their countries' own political, economic, and institutional structures.

## I. EU ENERGY EFFICIENCY INSTITUTIONS AND LAW

### A. *The EU's Governmental Structure*

The EU is a community of twenty-seven "Member States" that have consented to relinquishing some sovereignty to the EU's supranational institutions.<sup>11</sup> The key institutions in EU lawmaking and implementation are the European Parliament, the Council of the European Union, and the European Commission. The Parliament is made up of members directly elected via national elections every five years in each Member State.<sup>12</sup> In contrast, the Council is made up of one representative of each Member State, depending at any given time on the subject matter under discussion.<sup>13</sup> The Parliament and the Council jointly share legislative responsibilities for passing the laws governing energy efficiency, and the Parliament has the additional function of supervising the Commission.<sup>14</sup>

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<sup>11</sup> KAREN DAVIES, UNDERSTANDING EUROPEAN UNION LAW 25 (3d ed. 2007).

<sup>12</sup> *Id.* at 27.

<sup>13</sup> *Id.* at 31–32. For example, if an environmental issue is being discussed by the Council, typically the environmental minister of each Member State will attend. *Id.*

<sup>14</sup> *Id.* at 28–33.

The European Commission is the Community's civil service. But, it has more authority than many civil services, with legislative, administrative, executive, and quasi-judicial functions.<sup>15</sup> It has the important role of initiating draft legislation sent to the Council. Additionally, the Commission supervises the implementation of legislation once passed, manages the EU's annual budget, and investigates and brings Member States that it believes to be in violation of EU obligations before the European Court of Justice.<sup>16</sup> The Commission's Directorate General for Transportation and Energy is charged with managing laws related to energy efficiency (and energy policy in general).<sup>17</sup> For the most part, this note focuses on the work of the Commission as the key authority involved in the post-enactment stages of energy efficiency law and policy, given the note's focus on implementation, enforcement, and financing.

### B. *The EU's Lawmaking Framework*

Because the EU is a collection of sovereign Member States, it only has authority to legislate in those areas for which the Member States have ceded authority to the EU.<sup>18</sup> The EU's current legal framework<sup>19</sup> does not permit the EU to establish an overarching common energy policy (though the proposed but not yet ratified Treaty establishing a Constitution for Europe would allow for a more comprehensive EU energy policy).<sup>20</sup> Thus, actions to

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<sup>15</sup> *Id.* at 37.

<sup>16</sup> *Id.* at 37–39.

<sup>17</sup> European Commission, Directorate-General for Energy and Transport, Mission of the Directorate-General for Energy and Transport, [http://ec.europa.eu/dgs/energy\\_transport/wcm/mission\\_dg\\_tren.pdf](http://ec.europa.eu/dgs/energy_transport/wcm/mission_dg_tren.pdf) (last visited Mar. 12, 2009).

<sup>18</sup> See DAVIES, *supra* note 11, at 14.

<sup>19</sup> The EU's framework is currently governed by the Treaty on the EU and the Treaty Establishing the European Communities as amended by the Treaty of Nice in 2001. Treaty of Nice, Feb. 26, 2001, 2001 O.J. (C 80) 1. Further references will be made to the most recent consolidated version of the Treaty establishing the European Community. See Consolidated Version of the Treaty Establishing the European Community, 2002 O.J. (C 325) 1 [hereinafter EC Treaty].

<sup>20</sup> Itziar Martínez de Alegría Mancisidor et al., *European Union's Renewable Energy Sources and Energy Efficiency Policy Review: The Spanish Perspective*, 13 RENEWABLE & SUSTAINABLE ENERGY REV. 100, 101 & n.7 (2009). Recently, the future of the Treaty has been thrown even further into doubt, as Ireland failed to ratify the proposed Treaty of Lisbon in June 2008. However, many European leaders still express hope that a resolution can be reached that does not declare the Treaty dead. See Euractiv, *EU Treaty: What Next?*, July 22, 2008,

promote energy efficiency have developed under other justifications found in the European Union Treaty (including external relations, internal market, and the environment), leading to what some have criticized as a fragmented group of policies.<sup>21</sup>

Moreover, the EU principle of subsidiarity plays an important role in the development and implementation of energy efficiency laws. Subsidiarity is a federalist principle, formally recognized in the European Union Treaty.<sup>22</sup> The principle “provides that decisions relating to areas where the Community and the Member States have joint competence to act should be taken at the most appropriate level, as close to the citizen as possible, providing there is no loss of effectiveness.”<sup>23</sup> In keeping with this principle, the vast majority of EU energy efficiency laws are in the form of directives.<sup>24</sup> Directives are binding on the Member States as to the result to be achieved, but leave the choice of methods to the Member States.<sup>25</sup> Generally, the rights and obligations created by a directive only become effective once incorporated by the Member States into national law.<sup>26</sup> The advantage of directives is that they provide a far greater degree of flexibility to Member States in choosing how to best achieve a specific goal than do regulations (which are fully binding without further legislative action at the Member State level).<sup>27</sup> On the other hand, enforcement of directives presents some challenges, discussed *infra* Part III.

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<http://www.euractiv.com/en/future-eu/eu-treaty/article-174339>.

<sup>21</sup> See Martínez et al., *supra* note 20, at 101 (“[A]ctions related to promote [renewable energy sources] and [energy efficiency] have developed under different policies . . . resulting in a lack of transparency for both political decision makers and industry.”).

<sup>22</sup> DAVIES, *supra* note 11, at 25.

<sup>23</sup> *Id.*

<sup>24</sup> The Buildings Directive illustrates its commitment to subsidiarity explicitly: “general principles providing for a system of energy performance requirements and its objectives should be established at Community level, but the detailed implementation should be left to Member States, thus allowing each Member State to choose the regime which corresponds best to its particular situation.” Council Directive 2002/91, On the Energy Performance of Buildings, finding 21, 2003 O.J. (L 1) 65, 66 (EC) [hereinafter Buildings Directive].

<sup>25</sup> EC Treaty, *supra* note 19, art. 249, 2002 O.J. (C 325) at 132.

<sup>26</sup> DAVIES, *supra* note 11, at 50.

<sup>27</sup> *Id.* at 49–50.



### C. Overview of Current EU Energy Efficiency Laws

The first European energy efficiency policy developed in the wake of the 1973 oil crisis,<sup>28</sup> but work on energy efficiency declined as the crisis abated. It did not begin again in earnest until environmental concerns over energy consumption surfaced in the 1990s.<sup>29</sup> After a series of directives during the 1990s, the European Commission developed a concrete Action Plan on energy efficiency for the period 2000–2006 that led to the promulgation of updated directives on buildings and products.<sup>30</sup> Most recently, the EU passed a more comprehensive directive on energy efficiency, which sets an efficiency goal to be reached by all Member States and requires each Member State to develop an action plan outlining how it will achieve it.

On the whole, EU actions have moved from more fragmented, sector-specific policies in earlier years to more comprehensive regulations, covering a broader range of products and services. One commentator has characterized EU energy efficiency policy as a dual approach of “market pull,” whereby energy efficiency information is provided to consumers in order to pull the market in the right direction, and “market push,” whereby minimum efficiency requirements are enacted to remove energy inefficient products and services from the market.<sup>31</sup> EU laws tend to be organized by sector, often with these ‘push’ and ‘pull’ mechanisms at work in each individual sector. The following section provides an overview of the major EU laws governing energy efficiency, which are also summarized in Table 1.

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<sup>28</sup> Véronique Bruggeman, *Energy Efficiency as a Criterion for Regulation in the European Community*, 13 EUR. ENERGY & ENVTL. L. REV. 140, 140 (2004).

<sup>29</sup> *See id.*

<sup>30</sup> Communication from the Commission (EC) No. 14349, Action Plan for Energy Efficiency: Realising the Potential (Oct. 10, 2006) [hereinafter Action Plan], available at <http://register.consilium.europa.eu/pdf/en/06/st14/st14349.en06.pdf>.

<sup>31</sup> Bruggeman, *supra* note 28, at 142.

TABLE 1. MAJOR EU ENERGY EFFICIENCY LAWS<sup>32</sup>

Year	Sectoral Focus	Title	Summary of Key Provisions
2006	<b>Comprehensive</b>	Directive 2006/32/EC on energy end-use efficiency and energy services	Requires Member States to adopt a national indicative (non-binding) target for energy efficiency of 9 percent savings from 2008 levels by 2016, and requires Member States to submit national action plans detailing their plans for achieving the target.
2005	<b>All products, potentially</b>	Directive 2005/32/EC establishing a framework for the setting of eco-design requirements for energy-using products	Establishes a framework under which the Commission can regulate any energy-using products. Between 2007 and 2008, the Commission is beginning to adopt eco-design requirements in the form of implementing directives for fourteen product groups, including boilers, water heaters, consumer electronics, copying machines, televisions, standby modes, chargers, lighting, electric motors, and street lighting.
2004	<b>Cogeneration</b>	Directive 2004/8/EC on the promotion of cogeneration based on a useful heat demand in the internal energy market	Requires Member States to prepare national assessments of their potential for high efficiency cogeneration and to implement a system of Guarantees of Origin to track electricity produced from cogeneration.

<sup>32</sup> This table draws from the referenced Directives to create short synopses of the major laws; each law is discussed in more detail *infra* Part I(C).

2003	<b>Energy Taxes</b>	Directive 2003/96/EC on energy taxation	Harmonizes Member State energy taxes to a specified floor by requiring minimum taxes for motor fuels, gas oil, heating fuels, and electricity.
2003	<b>Manufacturing and Electricity Production</b>	Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community	Establishes a cap and trade scheme for greenhouse gas emissions, which may indirectly encourage energy efficiency innovations as part of an emissions reduction strategy.
2002	<b>Buildings</b>	Directive 2002/91/EC on the energy performance of buildings	Requires each Member State to develop a methodology to calculate the energy efficiency of buildings and set standards that new buildings and large buildings undergoing renovation must meet.
1992	<b>Domestic Appliances</b>	Directive 92/75/EEC on the indication by labeling and standard product information of the consumption of energy and other resources by household appliances	Requires suppliers to label household appliances offered for sale with information relating to their consumption of energy. To date, specific regulations have been passed for refrigerators, freezers, ovens, air conditioners, dishwashers, lamps, washing machines, and combined washer-driers.

### 1. *End-use Energy Efficiency*

The most recent EU energy efficiency directive also has the potential to be the most comprehensive, as it aims to achieve overall national reductions in energy consumption rather than focusing on particular sectors, as other directives do. Directive 2006/32/EC on energy end-use efficiency and energy services requires Member States to create national plans for achieving a 9 percent energy efficiency savings by 2016, as measured from

January 1, 2008.<sup>33</sup> The directive applies to supply and distribution of electricity, gas, heating, and fuels to households, transport, and industrial consumers.<sup>34</sup> Member States are required to establish a national authority to implement the law and report progress towards achieving the national target, and are also required to introduce energy efficiency improvements into their public sectors.<sup>35</sup> To help the Commission track progress, Member States must establish interim three-year targets as well, and must submit periodic progress reports to the Commission.<sup>36</sup> However, the 9 percent target and all interim targets are explicitly non-binding and not legally enforceable.<sup>37</sup> Thus, while the Directive requires some public sector leadership and attempts to cajole at least some annual progress by requiring yearly reports, it imposes no real quantitative obligations on Member States.<sup>38</sup> The directive is therefore more of a monitoring tool than anything else, especially because it charges the Commission to produce periodic reports on the success of achieving national targets and to recommend any additional action that needs to be taken at the Community level.<sup>39</sup>

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<sup>33</sup> Council Directive 2006/32, On Energy End-use Efficiency and Energy Services, art. 4, 2006 O.J. (L 114) 64, 69 (EC) [hereinafter End-use Energy Directive].

<sup>34</sup> *Id.* art. 2, at 67.

<sup>35</sup> *Id.* art. 4–6, at 69–70.

<sup>36</sup> *Id.* art. 4, 14, at 69, 72–73.

<sup>37</sup> *Id.*, at 65. While there was some debate over whether the national targets should be binding, and a strong push from Denmark at the Council of the European Union, ultimately a majority of delegates opposed binding targets, arguing that the potential for further energy efficiency savings varies too greatly from one Member State to another to make binding targets equitable. See Council of the European Union, TTE (Energy) Council, *TTE (Energy) Council on 23 November 2006 Energy Policy for Europe Sustainability of Energy Production and Consumption: Promoting Energy Efficiency and Renewable Energy—Adoption of Council Conclusions on the Action Plan on Energy Efficiency*, § II, Doc. 15210/06 (Nov. 16, 2006), available at <http://register.consilium.europa.eu/pdf/en/06/st15/st15210.en06.pdf>.

<sup>38</sup> Other noteworthy foci of the directive include informational reporting requirements for energy distributors and energy sales companies, reformation of existing financing and tariff rules surrounding energy efficiency, and Member State provision of energy audits and advanced energy metering for individual customers. End-Use Energy Directive, *supra* note 33, arts. 6–13, at 70–72.

<sup>39</sup> *Id.*, art. 14, at 72–73.

## 2. Buildings

Legislation governing the energy efficiency of buildings began in 1989, with the passage of a directive on construction materials.<sup>40</sup> Further legislation passed in the 1990s addressed the regulation of boilers<sup>41</sup> and energy certification requirements for buildings.<sup>42</sup> In 2002, the Community passed a more comprehensive buildings directive, which is now the key law governing the energy performance of buildings.<sup>43</sup>

Directive 2002/91/EC on the energy performance of buildings begins by acknowledging that buildings account for approximately forty percent of European Union energy consumption and therefore offer a huge potential for energy efficiency savings.<sup>44</sup> The directive first requires Member States to adopt a methodology to calculate the energy performance of buildings, at a national or regional level.<sup>45</sup> Member States must then set minimum energy performance requirements for new buildings and renovations on existing large buildings.<sup>46</sup> All necessary national laws, regulations, and administrative provisions to comply with the directive must be in place by 2009.<sup>47</sup> When fully implemented, the measures in the directive should supply a savings of around forty million tons of oil equivalent (Mtoe) through the year 2020.<sup>48</sup> After 2009, the

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<sup>40</sup> Council Directive 89/106, On the Approximation of Laws, Regulations and Administrative Provisions of the Member States Relating to Construction Products, 1989 O.J. (L 40) 12 (EEC).

<sup>41</sup> Council Directive 92/42, 1992 O.J. (L 167) 17 (EC).

<sup>42</sup> Council Directive 93/76, To Limit Carbon Dioxide Emissions by Improving Energy Efficiency (SAVE), 1993 O.J. (L 237) 28 (EEC).

<sup>43</sup> Buildings Directive, *supra* note 24.

<sup>44</sup> *Id.* finding 6, 2003 O.J. (L 1) at 65.

<sup>45</sup> *Id.* art. 3, 2003 O.J. (L 1) at 67.

<sup>46</sup> *Id.* art. 6, 2003 O.J. (L 1) at 68. Large buildings are currently defined as those buildings “with a total useful floor area over 1000 m<sup>2</sup>.” *Id.* Member States are also required to make available to owners, buyers, and tenants energy performance certificates that detail the energy performance of the building and include legal standards and benchmarks to allow for comparison. *Id.* art. 7, 2003 O.J. (L 1) at 68. Finally, the directive also requires that boilers and air conditioning systems be inspected on a regular basis. *Id.* art. 8, 2003 O.J. (L 1) at 68.

<sup>47</sup> In fact, article 15 calls for full adoption of the directive by January 2006, Buildings Directive, *supra* note 24, 2003 O.J. (L 1) at 69, but the Commission has allowed Member States to apply for an additional period of three years to fully apply the provisions of the directive. See Action Plan, *supra* note 30, at 12 n.25.

<sup>48</sup> *Green Paper*, *supra* note 5, at 19. By way of comparison, total EU

Commission plans to propose an expanded scope for the directive (possibly including the imposition of requirements on small building renovations as well as large).<sup>49</sup>

### 3. *Domestic Appliance Labeling*

One of the EU's earliest efforts at regulating energy efficiency was its 1992 passage of Directive 92/75/EEC on product labeling.<sup>50</sup> The directive emphasized the power that accurate and comparable information provided to consumers can have on their purchasing choices and sought to capitalize on this potential.<sup>51</sup> This directive requires suppliers to label household appliances with information related to their consumption of energy.<sup>52</sup> Specific rules promulgated under the directive between 1995 and 2003 include energy labeling requirements for household electric refrigerators and freezers, electric ovens, dishwashers, lamps, washers, and dryers.<sup>53</sup>

The EU's labeling laws are generally regarded as successful in promoting the use of more efficient products.<sup>54</sup> Unfortunately, though, efficiency gains from labeling have been more than offset by steeply rising demand for household appliances. That is, though individual products are becoming more efficient, the

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consumption in the year 2004 was 1745 Mtoe. *Commission Annex to the Green Paper on A European Strategy for Sustainable, Competitive and Secure Energy, What is at Stake*, Working Document, at 7 COM (2006) 105 final (Aug. 3, 2006) available at [http://www.energy.eu/directives/2006\\_03\\_08\\_gp\\_working\\_document\\_en.pdf](http://www.energy.eu/directives/2006_03_08_gp_working_document_en.pdf).

<sup>49</sup> Action Plan, *supra* note 30, at 12; *Green Paper*, *supra* note 5, at 19.

<sup>50</sup> Council Directive 92/75, On the Indication by Labelling and Standard Product Information of the Consumption of Energy and Other Resources by Household Appliances, 1992 O.J. (L 297) 16 (EEC) [hereinafter Labeling Directive].

<sup>51</sup> *Id.*

<sup>52</sup> *Id.* art. 2., at 17.

<sup>53</sup> See Commission Directive 2003/66/EC, 2003 O.J. (L 170) 10 (EC) (electric refrigerators and freezers); Commission Directive 2002/40, 2002 O.J. (L 128) 45 (EC) (electric ovens); Commission Directive 2002/31, 2002 O.J. (L 86) 26 (EC) (air conditioners); Commission Directive 1999/9, 1999 O.J. (L 56) 46 (EC) (dishwashers); Commission Directive 98/11, 1998 O.J. (L 71) 1 (EC) (lamps); Commission Directive 96/60, 1996 O.J. (L 266) 1 (EC) (washer-driers); Commission Directive 95/13, 1995 O.J. (L 136) 28 (EC) (tumble driers); Commission Directive 95/12, 1995 O.J. (L 136) 1 (EC) (washing machines).

<sup>54</sup> Commission of the European Communities, *Report on the Analysis of the Debate of the Green Paper on Energy Efficiency*, Working Document, at 8 COM (2005) 265 final (May 29, 2006).

overall rise in household appliance usage has resulted in a net increase in energy consumption.<sup>55</sup> This conundrum suggests that labeling laws may need to be updated frequently to keep pace with growing use of appliances, both to ensure that they cover new appliances and that standards remain sufficiently stringent for regulated appliances.

#### 4. Cogeneration (Combined Heat and Power)

In 2004, the EU adopted legislation on cogeneration to promote its ability to transform the waste of primary energy generation into usable by-products.<sup>56</sup> Cogeneration, also known as combined heat and power (CHP) is the simultaneous generation in one process of thermal energy and electrical energy;<sup>57</sup> typically, the thermal heat that would otherwise be wasted in electricity production is captured and used for heating or cooling. In 1998, electricity from cogeneration accounted for 11 percent of total energy production in the EU; it is estimated that if this percentage were increased to 18 percent, the EU would save around 3 to 4 percent of total gross energy consumption.<sup>58</sup> The main accomplishments of the cogeneration directive are (1) requiring Member States to create a certification system known as “guarantees of origin” that ensures the authenticity of electricity produced from high efficiency cogeneration,<sup>59</sup> and (2) the establishment of EU-wide efficiency standards for cogeneration by the EU commission.<sup>60</sup> Guarantees of origin are electronic certificates issued from a national body to producers of electricity from cogeneration, and will allow Member States to directly verify and track the amount of cogeneration occurring.<sup>61</sup> Although the directive does call for Member States to conduct analyses of the

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<sup>55</sup> See generally Edgar G. Hertwich, *Consumption and the Rebound Effect: An Industrial Ecology Perspective*, J. INDUS. ECOLOGY, Jan. 2005, at 85.

<sup>56</sup> Council Directive 2004/8, On the Promotion of Cogeneration Based on a Useful Heat Demand in the Internal Energy Market, 2004 O.J. (L 52) 50 (EC) [hereinafter Cogeneration Directive].

<sup>57</sup> *Id.* art. 3, at 53.

<sup>58</sup> ASSEMBLY OF EUROPEAN REGIONS, EU LEGISLATION ON ENERGY EFFICIENCY (2007), available at <http://www.aer.eu/index.php?id=1592> (click on hyperlink for Note on EU energy efficiency policy).

<sup>59</sup> Cogeneration Directive, *supra* note 56, art. 5, at 54.

<sup>60</sup> *Id.* art. 4, at 53–54.

<sup>61</sup> *Id.* art. 5, at 54. These are analogous to renewable energy credits in the U.S. See *infra* note 109.

cogeneration's potential in their individual countries,<sup>62</sup> it has been criticized for failing to establish any quantitative targets for the minimum amount of electricity that must come from cogeneration.<sup>63</sup> Since passage of the directive, cogeneration has risen only from 11 to 13 percent of electricity consumed, and the Commission acknowledges that more action is necessary in this area to stimulate further progress.<sup>64</sup>

### 5. *Eco-design of Products*

In 2005, the EU passed a directive that establishes a framework for setting eco-design requirements for energy-using products, with the aim of increasing energy savings from all consumer products running on electricity.<sup>65</sup> The directive establishes a “framework” that lays out broad goals and then instructs the Commission to adopt specific regulations through “implementing measures” that set product-specific energy efficiency requirements.<sup>66</sup> It also requires Member States to designate a national authority that is responsible for testing and labeling all products entering the market, and for recalling any non-compliant products.<sup>67</sup>

The Commission hoped to adopt eco-design requirements in the form of implementing directives for fourteen product groups from 2007 to 2008, including boilers, water heaters, consumer electronics, copying machines, televisions, standby modes, chargers, lighting, electric motors, and street lighting.<sup>68</sup> Thus far the Commission has proposed, and Member States have approved, standards for office, industrial, and street lighting, and for set-top television boxes.<sup>69</sup> These standards were approved by Parliament

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<sup>62</sup> Cogeneration Directive, *supra* note 56, art. 6, at 54.

<sup>63</sup> See, e.g., Martínez de Alegría Mancisidor et al., *supra* note 20, at 104–05.

<sup>64</sup> Action Plan, *supra* note 30, at 14.

<sup>65</sup> Council Directive 2005/32, Establishing a Framework for the Setting of Ecodesign Requirements for Energy-Using Products, 2005 O.J. (L 191) 29 (EC) [hereinafter *Eco-Design Directive*].

<sup>66</sup> *Id.*, art. 15, at 39–41.

<sup>67</sup> *Id.*, arts. 3, 5, at 35–36.

<sup>68</sup> Action Plan, *supra* note 30, at 10.

<sup>69</sup> Press Release, European Commission Eco-design Regulatory Committee, Member States Endorse Commission Proposals to Reduce Electricity Consumption, IP/08/1419 (Sept. 26, 2008) [hereinafter *Eco-design Regulatory Committee*], available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/1419>.



in early 2009.<sup>70</sup> The Commission also introduced a new proposal in July 2008 to reduce the electricity used in standby mode for a number of products,<sup>71</sup> and reported in fall 2008 that it plans to propose several more specific implementing measures in the coming months.<sup>72</sup>

## 6. *Indirect and Market Mechanisms*

### a. *Taxation*

While not directly a measure regulating energy efficiency, the EU's 2003 Energy Tax Directive is designed in part to achieve more energy efficiency. The Directive requires Member States to harmonize their taxes to meet at least a minimum level of taxation for motor fuels, gas oil, heating fuels, and electricity by 2004. However, the Directive grants an extended timeline for compliance to a majority of Member States—it does not require full compliance until 2010.<sup>73</sup> Implementation of these taxes has been one of the more contentious areas of policy in Europe; countries have raised diverse concerns including worries about the effects of the taxes on national competitiveness and about the regressivity of the taxes.<sup>74</sup> Countries have been hesitant to pass any laws to harmonize taxation levels—no one appears willing to act first in the absence of commitments from other countries.<sup>75</sup>

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<sup>70</sup> Euractiv, Parliament paves way for wider eco-design product list, Feb. 18, 2009, <http://www.euractiv.com/en/energy-efficiency/parliament-paves-way-wider-eco-design-product-list/article-179566>.

<sup>71</sup> Memorandum, European Commission, Commission's Proposals to Reduce Standby Electric Power Consumption, MEMO/08/488 (July 8, 2008), available at <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/488&format=HTML&aged=0&language=EN&guiLanguage=en>.

<sup>72</sup> See Eco-design Regulatory Committee, *supra* note 69.

<sup>73</sup> Council Directive 2003/96, Restructuring the Community Framework for the Taxation of Energy Products and Electricity, art. 18, 2003 O.J. (L 283) 51, 58–59 (EC). The extended timeline granted to several Member States is likely a compromise struck in the directive's drafting, given the contentiousness of implementation discussed *infra*.

<sup>74</sup> Eric Engle, *Ecotaxes and the European Union*, 16 EUR. ENERGY & ENVTL. L. REV. 298, 303 (2007).

<sup>75</sup> Engle describes the problem of getting Member States to move forward on changing their taxation policies as an eco-tax version of the prisoners' dilemma, everyone would benefit if action were taken, but no one wants to risk moving first, having other countries renege, and thus placing their industries at a competitive disadvantage. *Id.*

b. *Emissions Trading for the Power Sector and Electricity-Heavy Industries*

Traditionally, the EU has left industrial energy efficiency policy to the Member States, largely because Member States have had success in negotiating long-term agreements with major national industries for voluntary energy efficiency improvements and in creating energy audit programs.<sup>76</sup> However, more recently the EU implemented a major new law that creates a cap-and-trade scheme for greenhouse gas emissions from several EU industrial sectors, including electricity, metal processing, cement, glass, ceramics, pulp, paper, and board.<sup>77</sup> This EU Emissions Trading Scheme (ETS) covers about 46 percent of total EU CO<sub>2</sub> emissions by imposing emissions caps on around twelve thousand industrial installations (*i.e.*, facilities).<sup>78</sup> While not primarily focusing on energy efficiency, the scheme should encourage energy efficiency improvements indirectly by making it more expensive to emit CO<sub>2</sub> and therefore more expensive to consume energy. However, some experts are skeptical of the impact that the EU ETS will have on energy efficiency improvements, arguing that the indirect incentive created is likely to be only minor given the design of the scheme.<sup>79</sup>

7. *Complementary Actions Towards Implementation*

The EU is not reliant on regulation alone to achieve further energy efficiency gains; it has a range of complementary tools to help achieve its goals.<sup>80</sup> These tools include voluntary agreements with industry, provision of information to consumers, and a

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<sup>76</sup> PAOLO BERTOLDI ET AL., 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 1 (2007), available at <http://www.energyagency.at/publ/pdf/papier03.pdf>.

<sup>77</sup> Council Directive 2003/87, Establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community, art. 1, Annex I, 2003 O.J. (L 275) 32, 34, 42 (EC). Annex I of the Directive lists the exact industrial processes covered and specific exemptions available for small firms and experimental processes. *Id.* at 42.

<sup>78</sup> PAOLO BERTOLDI ET AL., WILL EMISSION TRADING PROMOTE END-USE ENERGY EFFICIENCY AND RENEWABLE ENERGY PROJECTS? ACEEE SUMMER STUDY ON ENERGY EFFICIENCY IN INDUSTRY 1 (2005), available at <http://re.jrc.ec.europa.eu/energyefficiency/pdf/publications/ACEEE%202005%20paper%2014%20final.pdf>.

<sup>79</sup> See, e.g., *id.* at 1–5.

<sup>80</sup> Working Document for Action Plan, *supra* note 3, at 15.

Commission-run support program to help Member States achieve the ambitious goals the EU has set.<sup>81</sup>

The Commission's primary support program for helping Member States and regional authorities to implement energy efficiency programs and projects is Intelligent Energy-Europe (IEE). The program is now in its second phase and will run from 2007 to 2013. IEE's stated goal is to "speed up efforts to achieve the objectives in the field of sustainable energy."<sup>82</sup> To this end it funds a wide variety of projects that improve energy efficiency in buildings, industry, and appliances.<sup>83</sup> The EU also has established a voluntary office equipment labeling program known as Energy Star, created through an agreement with the United States. Under the program, office equipment manufacturers can apply to the Commission for an Energy Star logo to be placed on qualifying efficient office equipment.<sup>84</sup> Similarly, the EU has run a successful GreenLight program since 2000 for voluntary actions in energy efficiency lighting. There are currently around 190 organizations participating in GreenLight, contributing a total savings of approximately 100 GWh/year through installing more energy-efficient lighting in their facilities.<sup>85</sup>

These complementary measures are excellent in providing short-term solutions, often with significant participation, that help to fill the time lag in implementation of EU directives.<sup>86</sup> However, the Commission reports that the track record on voluntary

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<sup>81</sup> See, e.g., Action Plan, *supra* note 30.

<sup>82</sup> Europa, *Competitiveness and Innovation Framework Programme*, <http://europa.eu/scadplus/leg/en/lvb/n26104.htm> (last visited Mar. 15, 2009).

<sup>83</sup> See generally Intelligent Energy Europe, European Commission, [http://ec.europa.eu/energy/intelligent/index\\_en.html](http://ec.europa.eu/energy/intelligent/index_en.html) (last visited Dec. 21, 2007). Initiatives include more detailed projects (e.g. improving the energy performance of schools), and broader capacity-building projects at the Member State level. The most prominent example of this type of program is "Implementing EU Appliance Policy in Central and Eastern Europe," which helps to put EU energy efficiency policies into place in the newer EU states by training national experts, putting forth templates for national plans, and facilitating exchange of best practices. See Intelligent Energy Executive Agency, European Commission, *Energy Efficient Equipment and Products* 8 (Dec. 2006), available at [http://ec.europa.eu/energy/intelligent/library/doc/ka\\_reports/equipment.pdf](http://ec.europa.eu/energy/intelligent/library/doc/ka_reports/equipment.pdf).

<sup>84</sup> Council Regulation 2422/2001, art. 5, 2001 O.J. (L 332) 1, 3 (EC).

<sup>85</sup> Paolo Bertoldi & Calin Ciugudeanu, *European Commission, Five-year Assessment of the European GreenLight Programme*, 1, 6, available at <http://re.jrc.ec.europa.eu/energyefficiency/pdf/publications/RL6%20Paper%20GreenLight%20final.pdf>.

<sup>86</sup> Bruggeman, *supra* note 28, at 141.

agreements is “patchy.”<sup>87</sup> This patchiness suggests that while voluntary programs can act as excellent complements to energy efficiency laws, they are not a sufficient stand-alone solution, even in an environmentally conscious community like the EU.

#### D. *Success of Current Policies and Looking Ahead*

While the EU has improved and continues to improve its energy efficiency, it still faces certain difficulties in realizing its full potential for energy savings. Since 1990, the EU’s energy intensity (a measure of energy consumed per dollar of GDP generated) has steadily improved; however, it has not improved enough to counter the rise in GDP during the same period.<sup>88</sup> The consequence is that final energy consumption has risen despite gains in energy efficiency.<sup>89</sup> Improvements have also slowed in recent years compared to early years of policy implementation: whereas annual gains of 1.4 percent of energy consumed per dollar GDP were made in the early 1990s, by 2003 these gains had fallen to 0.5 percent per year.<sup>90</sup> The reasons for this decrease in improvements include a decrease in energy prices and what has been termed the “rebound effect”—as energy becomes more efficient and therefore cheaper, people increase their demand as a consequence of the falling price, thereby eliminating some or all of the gains made in energy efficiency.<sup>91</sup> More encouragingly, ‘negajoules,’ a measure of the energy saved from energy efficiency measures, now represent the EU’s single most important energy resource (calculated by projecting 1971 energy intensity onto current economic output to reflect what total consumption might have been absent efficiency improvements).<sup>92</sup> Figure 1 compares negajoules with other major energy sources.<sup>93</sup>

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<sup>87</sup> *Working Document for Action Plan*, *supra* note 3, at 15.

<sup>88</sup> Draft Report on an Action Plan for Energy Efficiency: Realising the Potential, EUR. PARL. DOC. (INI 2106) 10 (2007) (Provisional), *available at* [http://www.europarl.europa.eu/meetdocs/2004\\_2009/documents/pr/670/670363/670363en.pdf](http://www.europarl.europa.eu/meetdocs/2004_2009/documents/pr/670/670363/670363en.pdf).

<sup>89</sup> *Id.*

<sup>90</sup> *Working Document for Action Plan*, *supra* note 3, at 11.

<sup>91</sup> HOWARD GELLER & SOPHIE ATTALI, INT’L ENERGY AGENCY, THE EXPERIENCE WITH ENERGY EFFICIENCY POLICIES AND PROGRAMMES IN IEA COUNTRIES 5 (Aug. 2005).

<sup>92</sup> *Green Paper*, *supra* note 5, at 11. Essentially, a negajoule represents energy *not* consumed because of enhanced energy efficiency. Thus, ‘negajoules’ measure not actual sources of energy, but rather what projected energy

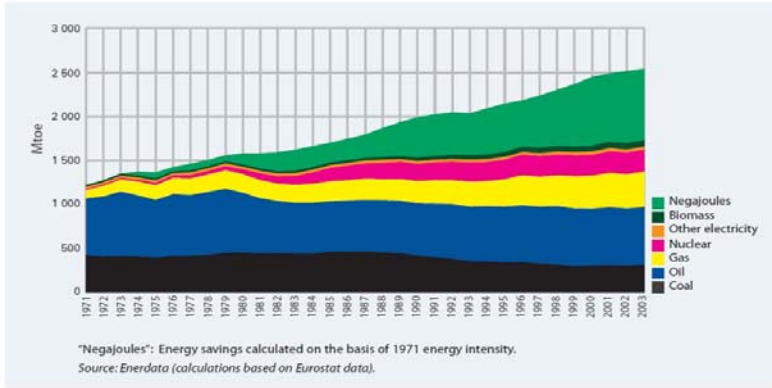


Figure 1. Development of primary energy demand and of “negajoules” in the EU-25

Evaluating the success of any particular energy efficiency policy is difficult, as gains in efficiency are often inspired by overlapping policies and incentives at the EU and Member State levels. Clearly, the broad scope of the EU’s efficiency regulations helps contribute to their effectiveness. The International Energy Agency estimated that around 32 percent of current EU electricity consumption was covered by some type of mandatory energy efficiency policy as of August 2007, and that planned policies would raise the coverage to around 62 percent.<sup>94</sup> Labeling and mandatory emissions standards were found to be one of the most cost-effective methods to meet energy demand.<sup>95</sup>

While the accomplishments of EU energy efficiency policy to date deserve praise, politicians and policy-makers throughout Europe recognize that there is much more to be done on energy efficiency. The European Commission has recently published a Green Paper on Energy Efficiency and an Energy Efficiency Action Plan for the years 2007–2012.<sup>96</sup> The Green Paper serves as a scoping paper in which the Commission identifies issues and

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consumption would have been absent investments in energy efficiency. Put differently, negajoules are a measure of the amount of energy supply the EU would have needed to construct had energy efficiency measures not been implemented.

<sup>93</sup> *Id.*

<sup>94</sup> MARK ELLIS, INT’L ENERGY AGENCY, EXPERIENCE WITH ENERGY EFFICIENCY REGULATIONS FOR ELECTRICAL EQUIPMENT 10 (Aug. 2007).

<sup>95</sup> *Id.* at 20.

<sup>96</sup> Action Plan, *supra* note 30; *Green Paper*, *supra* note 5.

solicits feedback, and the Action Plan lays out concrete Commission priorities in energy efficiency policy for six years. This Action Plan for 2007–2012 is actually the second Action Plan for Energy Efficiency; the first plan expired in 2006.

In some ways, there is as much to learn from these planned priorities as there is from past energy efficiency policy actions. The Action Plan highlights those areas where past EU energy efficiency policy has fallen short of expectations and needs further policy intervention. Even after fifteen years of steadily increasing energy efficiency policy, the EU calculates that it can save a further 20 percent of current energy consumption in a cost-effective manner, amounting to savings equal to the combined current energy consumption of Germany and Finland (around 390 million Mtoe) and saving the EU sixty billion euros per year.<sup>97</sup>

Briefly, some of the key challenges still remaining for the EU to face on energy efficiency are presented below along with the solutions proposed in the Commission's Green Paper and Action Plan:

1. **Challenge:** There is a lack of training to create experts and keep them apprised of the latest energy efficiency technologies.<sup>98</sup>

**Proposed Solutions:** The EU needs to develop a well-trained network of energy efficiency experts and service providers.<sup>99</sup> Energy efficiency training should be included in vocational training in order to overcome the current shortage of skilled personnel in the field.<sup>100</sup>

2. **Challenge:** Energy efficiency project developers lack access to adequate financial instruments to fund their projects. Banks are often reluctant to undertake the financing of energy efficiency projects, often due to a lack of technical knowledge, despite the fact that the projects generally have reliable paybacks.<sup>101</sup>

**Proposed Solutions:** The EU should explore the use of “global loans,” or funds redistributed from banks through a

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<sup>97</sup> *Green Paper*, *supra* note 5, at 5.

<sup>98</sup> *Id.* at 12.

<sup>99</sup> *Id.* at 14.

<sup>100</sup> *Working Document for Action Plan*, *supra* note 3, at 15.

<sup>101</sup> *Green Paper*, *supra* note 5, at 12.

clearinghouse that has some technical and economical expertise in energy efficiency investments.<sup>102</sup> Energy Service Companies also have a major role to play in financing energy efficiency improvements and these companies need more policy support for their activities.<sup>103</sup> The EU should work to create further EU-wide financing mechanisms for energy efficiency, possibly through the European Investment Bank or the European Regional Development Fund.<sup>104</sup>

3. **Challenge:** Taxes and the current pricing system for energy do not reflect the consequences of energy consumption well enough.<sup>105</sup>

**Proposed Solutions:** Real-time metering should be explored as a method to more accurately link energy prices and full costs of supply.<sup>106</sup> At the Community level, there should be more harmonization of energy tax regimes and better targeted state aid that helps in energy efficiency financing.<sup>107</sup> The Commission will publish a Green Paper that examines how indirect taxation could be used to incentivize energy efficiency.<sup>108</sup>

4. **Challenge:** More needs to be done to harness market forces for energy efficiency to overcome the disincentive barriers that suppliers typically face, whereby expanding energy efficiency measures lowers profits. (When the supplier sells less energy due to increases in efficiency, profits decline because they are traditionally reflective of the total amount of energy sold.)

**Proposed Solution:** The Commission will consider implementing an EU-wide white certificate system that would incentivize investment in energy efficiency by energy suppliers. The scheme would mirror those already used by Italy and the United Kingdom, requiring suppliers

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<sup>102</sup> *Id.* It will be interesting to see how recommendations for expanding capital available for energy efficiency will fare in the much tighter global economy that exists today as compared with when the Commission drafted its Action Plan.

<sup>103</sup> *Id.* at 13. These financing issues are discussed more in depth *infra* Part IV.

<sup>104</sup> *Id.* at 18.

<sup>105</sup> *Id.* at 13–14.

<sup>106</sup> *Id.* at 14.

<sup>107</sup> *Id.* at 17–18.

<sup>108</sup> Action Plan, *supra* note 30, at 17.

and distributors of electricity to undertake a certain amount of energy efficiency improvement measures for their final users or purchase certificates from other suppliers, EU-wide, that could make such improvements more economically.<sup>109</sup>

5. **Challenge:** The energy transformation sector is still highly inefficient—transformation losses currently account for 33 percent of primary EU energy consumption.<sup>110</sup>

**Proposed Solutions:** The Commission plans to develop minimum binding efficiency requirements for new electricity, heating, and cooling generation units under twenty MW in size (those not covered by the EU ETS).<sup>111</sup> The Commission also plans to propose a new regulatory framework to promote the connection of decentralized generation,<sup>112</sup> which will reduce transformation losses by locating electricity sources closer to consumers.

## II. IMPLEMENTATION OF EU ENERGY EFFICIENCY LAWS AND POLICY

There is reason to be optimistic about the future of EU energy efficiency policy given the breadth and depth of its laws and complementary programs, but as one commentator has aptly put it, “[r]egulations, however tough, are likely to mean little if Member States continually fail to implement them.”<sup>113</sup> The EU has had a

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<sup>109</sup> *Green Paper*, *supra* note 5, at 25. For a fuller explanation of white certificates, see *infra* Part IV(B). These white certificates are roughly analogous to the renewable energy credits (RECs) being used by many U.S. states to measure compliance with mandatory renewable energy policies. RECs are awarded to renewable energy generators and are then purchased by utilities as proof of compliance with state-level legal obligations to supply a certain percentage of their electricity from renewable sources. The critical advantage of using RECs or white certificates is that they can significantly lower compliance costs for utilities that have to meet certain targets. Costs are lowered by allowing any utility to simply purchase RECs/certificates from a different supplier, if another entity can produce renewable energy or energy efficiency improvements more cheaply. This system also creates a fair, competitive market that equalizes compliance costs across different geographic or market areas. See, e.g., RYAN WISER ET AL., LAWRENCE BERKELEY NAT’L LAB., RENEWABLE PORTFOLIO STANDARDS: A FACTUAL INTRODUCTION TO EXPERIENCE FROM THE UNITED STATES 3–4 (2007).

<sup>110</sup> Action Plan, *supra* note 30, at 13.

<sup>111</sup> *Id.* at 14.

<sup>112</sup> *Id.*

<sup>113</sup> PAUL K. LYONS, EU ENERGY POLICIES TOWARDS THE 21<sup>ST</sup> CENTURY 70 (1998).



mixed experience with implementation of its energy efficiency laws: while much progress has been made in improving energy efficiency across the major sectors, Member States are far from achieving complete implementation of EU-level laws. The key implementation challenge is how to induce Member States to undertake the actions imposed on them at the EU level. The main mechanism for compelling implementation is the design of the directives themselves, coupled with the enforcement mechanisms that will be discussed *infra* Part III. This section focuses on some of the key strategies contained within EU-level energy efficiency laws to prompt implementation of the directives at the EU and Member State level. While it draws from specific directives for examples, its primary goal is to highlight the general regulatory tools that EU law uses to encourage, cajole, and enforce implementation of its energy efficiency directives.<sup>114</sup>

#### A. Commission Responsibilities

One strategy the EU uses to achieve implementation is to write concrete responsibilities for the Commission directly into the energy efficiency laws. Namely, the Commission must create “daughter directives” for some programs, and bears reporting requirements for almost every program. In particular, the Labeling Directive and the Eco-Design Directive do not themselves create specific product standards, but rather require the Commission to adopt further directives regulating specific products.<sup>115</sup> In general, the Commission appears to achieve full implementation of its tasks with little enforcement effort; however, delays do occur, particularly in the implementation of some of its more ambitious

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<sup>114</sup> This paper constrains its scope to the implementation of EU energy efficiency laws; however, there is a second level at which energy efficiency legislation is passed outside of this Community framework, with some Member States choosing to independently pursue energy efficiency laws that exceed the scope and often the effectiveness of EU energy efficiency laws. For example, in its National Action Plan on Energy Efficiency, the United Kingdom reports that based on its domestic energy efficiency laws, it expects to double the EU-wide end-use efficiency target of 9 percent by 2016, reaching an 18 percent improvement in energy efficiency by 2016. See DEP’T FOR ENV’T, FOOD AND RURAL AFFAIRS, UK ENERGY EFFICIENCY ACTION PLAN, PB 12615, 13 (2007), available at <http://www.defra.gov.uk/environment/climatechange/uk/energy/pdf/action-plan-2007.pdf>.

<sup>115</sup> See Eco-Design Directive, *supra* note 65, art. 15, at 39–41; Labeling Directive, *supra* note 50, arts. 10–12, at 18–19.

timelines.<sup>116</sup> The fact that the Commission publishes such timelines, however, gives Parliament and the Council the ability to monitor the Commission's progress and make public any lapses in implementation—a 'shaming' strategy to prompt the Commission into quicker action.<sup>117</sup>

### B. *Member State Implementation*

As discussed *supra* section I(B), the implementation of EU laws follows the principle of subsidiarity, meaning that overall objectives are set at the EU level through directives, and responsibility for implementation falls heavily upon the Member States. The energy efficiency directives vary in the discrete implementation tasks that they require of the Member States, but there are some identifiable common methodologies that the energy efficiency laws use to encourage full implementation at the Member State level. This section identifies these common methodologies that serve as strategies to ensure implementation and provides examples of these methods in specific directives.

#### 1. *Transposition to National Law*

Each energy efficiency directive has a provision for *transposition*, whereby the Member States are required to bring into force the laws, regulations, and administrative provisions necessary to comply with the directive.<sup>118</sup> Each provides a date by which full transposition must occur and requires Member States to communicate the adoption of domestic laws fulfilling each directive's requirements to the Commission,<sup>119</sup> thus enabling easy tracking of Member States' compliance status.

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<sup>116</sup> For example, the Commission has been behind its originally announced schedule in implementing products standards under the Eco-design Directive. See *infra* Part I(C)(5).

<sup>117</sup> Notably, the Commission's lag in implementing the Eco-design Directive has not gone unnoticed. Parliament recently tried to shame them into faster implementation, deploring "the severe slippage in the timetable for the adoption of minimum energy performance standards for priority product groups." Draft Report on an Action Plan for Energy Efficiency: Realising the Potential, *supra* note 88, at 5.

<sup>118</sup> See, e.g., Buildings Directive, *supra* note 24, art. 15, 2003 O.J. (L 1) at 69; Labeling Directive, *supra* note 50, art. 14, at 19.

<sup>119</sup> See, e.g., Labeling Directive, *supra* note 50, art. 14, at 19.

## 2. *National Implementing Authorities*

In general, the directives leave the choice of implementing authority to the Member States, but they may enumerate some specific powers that the implementing authority must be granted. For example, in the case of the Eco-Design Directive, Member States may choose an authority responsible for market surveillance, but they must ensure that whatever ministry, department, agency, or other body chosen is empowered to monitor compliance and order recalls of non-compliant products.<sup>120</sup> Similarly, the Cogeneration Directive calls for Member States to designate a competent body to implement an accurate and reliable guarantee of origin system to certify that energy was produced using cogeneration.<sup>121</sup>

## 3. *Targets, Methodologies, and Performance Standards*

Some of the more concrete obligations placed upon Member States in many of the energy efficiency directives are the creation of targets, methodologies for objectively measuring progress of various actors, and performance standards. For example, the End-Use Energy Efficiency Directive requires each Member State to submit an Energy Efficiency Action Plan that sets an overall national target that will achieve 9 percent savings in nine years, sets an interim target to be established within three years, and provides “an overview of its strategy for achievement of the intermediate and overall targets.”<sup>122</sup> Further action plans, which must evaluate progress towards the national target and include plans for additional measures necessary to meet the targets, are due after four and seven years.<sup>123</sup> The Buildings Directive, while honoring subsidiarity by recognizing that regional differences may create a need for varying methodologies, calls for each Member State to create and apply a methodology at the national or regional level for calculating the energy performance of buildings.<sup>124</sup> Member States must also set minimum energy performance requirements for buildings.<sup>125</sup> Requiring targets, methodologies,

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<sup>120</sup> Eco-Design Directive, *supra* note 65, art. 3, at 35–36.

<sup>121</sup> Cogeneration Directive, *supra* note 56, art. 5, at 54.

<sup>122</sup> End-use Energy Directive, *supra* note 33, art. 4, at 69.

<sup>123</sup> *Id.* art. 14, at 72–73.

<sup>124</sup> Buildings Directive, *supra* note 24, art. 3, 2003 O.J. (L 1) at 67.

<sup>125</sup> *Id.* art. 4, 2003 O.J. (L 1) at 67–68.

and Action Plans at least ensures that Member States are devoting resources and staff to addressing the directive's aims, though it does not ensure full achievement of these aims.

#### 4. *Public Sector Leadership*

Given that the EU's public sector accounts for 5 to 10 percent of total EU energy consumption, public sector obligations can make a sizeable dent in cutting overall energy demand.<sup>126</sup> Because public sector obligations are imposed directly on Member State governments, such obligations are also easier to monitor than obligations imposed through Member States on private parties. Thus, public sector requirements are directly imposed in the End-Use Energy Efficiency Directive, which generally requires that "Member States shall ensure that the public sector fulfils an exemplary role in the context of this Directive."<sup>127</sup> It goes on to concretize this obligation by requiring the passage of public procurement legislation that includes at least two EU-specified measures.<sup>128</sup>

#### 5. *Reporting Requirements*

Many of the energy efficiency directives also contain reporting requirements for Member States to make periodic assessments of their implementation progress. The goals of these reporting provisions seem to be to encourage information production and to force at least some action by requiring comprehensive planning and periodic progress reports, on the assumption that Member States are unlikely to be willing to report zero progress towards national goals. For example, while the Cogeneration Directive does not go so far as to set national targets, it does require that each Member State take the first step of establishing a national goal for how much cogeneration it plans to achieve, and then requires periodic reports (every four years) on progress towards increasing the share of high-efficiency cogeneration.<sup>129</sup> In addition to requiring each Member State to engage in at least a minimum amount of national energy efficiency planning, periodic reports are

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<sup>126</sup> Bruggeman, *supra* note 28, at 147.

<sup>127</sup> End-use Energy Directive, *supra* note 33, art. 5, at 69.

<sup>128</sup> *Id.* Member States must choose two activities from a list of EU-approved activities that is attached to the Directive as an appendix. *Id.*

<sup>129</sup> Cogeneration Directive, *supra* note 56, art. 6, at 54.

also useful to the Commission as an easy tool by which to track implementation progress.

### C. *Implementation: Progress and Challenges*

Overall, these implementation strategies are somewhat, but not fully, effective at inducing Member States to adopt into national law and execute on a national level the full goals of the EU energy efficiency directives. The level of implementation varies from Member State to Member State and from directive to directive, but more could and should be done to induce better implementation. One expert has called the Member States' approach to implementing EU environmental law "low key and minimalist," finding that "in practice, Member States have not been particularly diligent to ensure that relevant law and practice is aligned with the environmental obligations entered into by them at EU level."<sup>130</sup> The Commission also recognizes the gap in implementation, calling for Member States to "go further on implementing and realizing the full potential of current legislation" and to make "full use of local and regional Energy Agencies."<sup>131</sup>

One of the primary concerns that continues to plague the EU in implementation of energy efficiency laws is the large divergence in energy-savings potential and implementation capacity among countries. Average energy intensity is 60 percent higher in Southeastern Europe than in Western Europe,<sup>132</sup> and the Southeastern countries lag behind in the development of national energy policy and particularly in implementing cost-effective energy efficiency measures.<sup>133</sup> One report estimates that efficiency investments could economically save 30 to 50 percent of energy consumption in Southeastern Europe.<sup>134</sup> The fundamental problem in many of these countries is a lack of sufficient resources dedicated to energy efficiency to meet the EU objectives. By way of illustration, the Czech Energy Agency, responsible for implementing all energy efficiency measures, has a staff of twenty

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<sup>130</sup> MARTIN HEDEMANN-ROBINSON, ENFORCEMENT OF EUROPEAN UNION ENVIRONMENTAL LAW: LEGAL ISSUES AND CHALLENGES 5 (2007).

<sup>131</sup> *Working Document for Action Plan*, *supra* note 3, at 6.

<sup>132</sup> Emmanuel Bergasse, *What Energy Policy for South East Europe?*, PUB. SERVICE REV.: EUR. UNION, Spring 2003, at 34.

<sup>133</sup> See INT'L ENERGY AGENCY, ENERGY EFFICIENCY IN ECONOMIES IN TRANSITION: A POLICY PRIORITY 1 (Dec. 2004).

<sup>134</sup> *Id.*

and an annual budget of only three million euros; Poland's National Energy Conservation Agency has a staff of fewer than twenty.<sup>135</sup> In contrast, the Netherlands Agency for Energy and Environment has a staff of over 500 and a budget of more than 300 million euros (60 percent of which goes to energy).<sup>136</sup>

Parliament's Committee on Industry, Research and Energy recently lambasted the progress in the implementation of energy efficiency legislation in its comments on the new Energy Efficiency Action Plan: "[f]or the current Action Plan to work, previous legislation needs to have been implemented effectively. Nothing could be further from the case."<sup>137</sup> In particular, it found that the Buildings Directive had been properly transposed by only five of twenty-five Member States.<sup>138</sup> Ten different contributors to the Debate on the Green Paper for Energy Efficiency commented that implementation of the Buildings Directive was difficult because of a lack of expertise in designing and building,<sup>139</sup> this suggests a need for building more competency and capacity in this area, rather than a lack of will to implement. In contrast, there are reports that the implementation of the labeling directive, which is less technically complex, has gone extremely well and saved the EU twenty-four to thirty terawatt-hours<sup>140</sup> of energy consumption since 1995.<sup>141</sup> Savings through 2010 are expected to approximately double.<sup>142</sup>

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<sup>135</sup> *Id.* at 2.

<sup>136</sup> *Id.* at 2. This divergence is not explained by the countries' relative sizes: the Czech Republic's population is roughly 10.2 million; the Netherlands', 16.6 million. See U.S. Census Bureau, International Database, Country Summaries, <http://www.census.gov/ipc/www/idb/summaries.html> (last visited Jan. 25, 2009).

<sup>137</sup> Draft Report on an Action Plan for Energy Efficiency: Realising the Potential, *supra* note 88, at 11.

<sup>138</sup> *Id.* at 5.

<sup>139</sup> *Analysis of the Debate of the Green Paper on Energy Efficiency*, *supra* note 54, Annex I, at 37.

<sup>140</sup> Twenty-four to thirty terawatt-hours is 24,000,000–30,000,000 MWh. For reference, a MWh is the equivalent of powering approximately 750 households for one hour. GOV'T ACCOUNTABILITY OFFICE, DEP'T OF ENERGY: KEY CHALLENGES REMAIN FOR DEVELOPING AND DEPLOYING ADVANCED ENERGY TECHNOLOGIES TO MEET FUTURE NEEDS 2 (2006).

<sup>141</sup> Paolo Bertoldi & Bogdan Atanasiu, Inst. for Env't & Sustainability, European Commission, *Electricity Consumption and Efficiency Trends in the Enlarged European Union—Status Report 2006*, 55, EUR 22753 (2007).

<sup>142</sup> *Id.*

Intrinsically tied to the issue of implementation is that of enforcement—strong enforcement, or a perception that laws will be stringently enforced, creates more compliance. The EU lacks the power to directly legislate that the Member States devote more resources or expertise to energy efficiency, but it does have some enforcement capabilities that it exercises with regularity in an attempt to obtain greater implementation of the energy efficiency laws. This enforcement power is the subject of the next section.

### III. ENFORCEMENT

Given the EU's structure,<sup>143</sup> three levels of potential enforcement authority exist: the EU level, the Member State level, and the individual level (in national court). In practice, EU energy efficiency law enforcement is dominated by the EU level. This section details the procedure by which the EU enforces its energy efficiency laws, discusses recent and current enforcement actions, and explores the potential for expanding enforcement capabilities to the other levels of enforcement authority in order to increase effectiveness.

#### A. *EU Enforcement Procedure*

EU law clearly places an obligation on Member States to comply with all obligations contained in EU directives.<sup>144</sup> In theory, the Member States should play “a seminal role in the enforcement area, bearing legal obligations under EU law to ensure that the Union's environmental protection legislation is properly implemented within their respective territories and within the deadlines foreseen.”<sup>145</sup> In practice, Member States are not particularly diligent in ensuring the adoption and enforcement of all EU laws.<sup>146</sup> Fortunately, given this lack of enforcement action at the Member State level, the EC Treaty gives the Commission the authority to investigate and, if necessary, bring before the European Court of Justice (ECJ) any Member State that it believes has failed to fulfill its EU obligations.<sup>147</sup>

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<sup>143</sup> See *supra* Part I(A).

<sup>144</sup> EC Treaty, *supra* note 19, art. 10, 2002 O.J. (C 325) at 42.

<sup>145</sup> HEDEMANN-ROBINSON, *supra* note 130, at 5.

<sup>146</sup> *Id.*

<sup>147</sup> EC Treaty, *supra* note 19, art. 226, 2002 O.J. (C 325) at 125.

Commission enforcement action against a Member State involves two stages: the administrative stage and the judicial stage.<sup>148</sup> At the administrative stage, enforcement typically begins as a dialogue whereby the Commission attempts to remedy breaches informally through consultation and negotiation with non-compliant Member States.<sup>149</sup> If informal negotiations fail, the Commission issues a Letter of Formal Notice, which defines the breach it believes the Member State to have committed and requests compliance within a certain time frame.<sup>150</sup> If the breach is not remedied by the deadline, the Commission then issues a “reasoned opinion” that sets out the legal arguments for how the Member State has violated EU law, and allows it reasonable time to remedy its breach.<sup>151</sup>

After this deadline, the Commission can commence the judicial stage of enforcement through bringing action at the ECJ. If a judgment is won and a Member State still refuses to comply, the Commission can return to the ECJ and receive permission to levy fines against the Member State.<sup>152</sup> However, few enforcement proceedings ever reach the judicial stage.<sup>153</sup> One reason for the success of the administrative stage is that when disputes do reach this stage, ECJ judgments favor Member States over the Commission in only one in ten cases, and costs are assessed to Member States when they lose.<sup>154</sup> This track record creates a strong incentive for cooperation with the Commission before reaching the judicial stage.

The Commission can undertake the procedure described above to remedy two different types of breaches: non-transposition and bad application.<sup>155</sup> Non-transposition exists when a Member State fails to adopt national legislation that incorporates an EU Directive within the deadline set by the directive.<sup>156</sup> Bad application is where

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<sup>148</sup> DAVIES, *supra* note 11, at 89–90.

<sup>149</sup> *Id.* at 39.

<sup>150</sup> *Id.* at 89–90.

<sup>151</sup> *Id.* at 90.

<sup>152</sup> HEDEMANN-ROBINSON, *supra* note 130, at 31.

<sup>153</sup> *Id.*

<sup>154</sup> DAVIES, *supra* note 11, at 90. *See also, e.g.*, Case C-342/07, *Comm’n v. Hellenic Republic*, 2007 O.J. (C 211) 58, (ordering Greece to pay costs upon a finding that it did not properly transpose the Buildings Directive).

<sup>155</sup> HEDEMANN-ROBINSON, *supra* note 130, at 40–42.

<sup>156</sup> *Id.* at 41.



a Member State has the appropriate laws in place but fails to ensure that these laws are being implemented in practice.<sup>157</sup> Most often, the Commission focuses on enforcement of non-transposition simply because this is far easier to detect, given that Member States are required to report back to the Commission when they have passed the legislation necessary to transpose a directive.<sup>158</sup> Similarly, the Commission often focuses on “horizontal bad application,” where a number of Member States have failed to follow through on a specific commitment under a law, again usually detectable because of specific timetables for action set forth in a directive.<sup>159</sup> Because the Commission has very limited investigatory powers, it is difficult for it to detect single cases of bad application, and it is heavily reliant on complaints from the public or non-governmental organizations in those situations where it does bring a case for individual bad application.<sup>160</sup>

### B. *Enforcement of Energy Efficiency Laws*

The Commission has been active in its enforcement of energy efficiency laws in recent years.<sup>161</sup> In the past three years, it has sent around forty-five Reasoned Opinions and Letters of Formal Notice.<sup>162</sup> Table 2 details those enforcement proceedings undertaken by the Commission since December 2005. During the

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<sup>157</sup> *Id.* at 41–42.

<sup>158</sup> *Id.* at 41, 43.

<sup>159</sup> *Id.* at 42.

<sup>160</sup> *Id.* at 43.

<sup>161</sup> It is difficult to know the exact complaints that the Commission has had against Member States in particular enforcement actions, as the Commission does not publish Letters of Formal Notice or Reasoned Opinions, judging them to be confidential litigation documents. *Id.* at 196–97. However, the Commission does publish press releases outlining the formal enforcement actions that it is undertaking. *Id.*

<sup>162</sup> This number was obtained by searching EU press releases in the field of energy from December 2005 through October 2008 for news of enforcement actions, available at <http://europa.eu/rapid/searchAction.do>. (To obtain the same search results, input “IP-EC Press Release” into the “Type” field, the date range specified into the “Date Range” field, and “Energy” into the “Queries” option under the “Optional Search Criteria” field, and then manually search through results for press releases relating to the Commission taking legal action against Member States or issuing reasoned opinions against Member States.)

same period of time, only four cases have been referred to the European Court of Justice; Table 3 shows these cases.<sup>163</sup>

The high number of administrative enforcement actions taken, coupled with the low number of cases actually referred to the European Court of Justice, suggests that the Commission is quite successful at enforcing implementation of EU law through its more informal administrative channels. It is noteworthy, however, that all of the recent enforcement actions have been for failure to notify the Commission of transposition or failure to submit National Energy Efficiency Action Plans by the deadline. Thus, the Commission has focused its efforts on enforcing the first stage of EU law implementation—simply having the laws transposed into Member State law and incorporated into national planning activities. The Commission's enforcement actions do not indicate whether laws that are transposed by Member States are being effectively implemented on the ground. Given that the Commission brought 622 infringement cases in the field of energy and transport in 2005 alone,<sup>164</sup> it is unsurprising that it was able to focus on only those more egregious violations of non-transposition and not the more fact-specific instances of bad application. This inability to ensure quality application of transposed laws is an important shortcoming of EU-level energy efficiency law enforcement and EU environmental law enforcement in general.<sup>165</sup> It is discussed further in the following section in relation to possible solutions.

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<sup>163</sup> This number was obtained by searching the judgments of the ECJ in the field of energy for cases from December 2005 through October 2008, and then manually sorting through results to find those cases related to the energy efficiency directives, *available at* <http://curia.europa.eu/jurisp/cgi-bin/form.pl?lang=en>.

<sup>164</sup> 23rd Annual Report on Monitoring the Application of Community Law, EUR. PARL. DOC. (INI 2271) 9 (2005), *available at* <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0416:FIN:EN:PDF>.

<sup>165</sup> See HEDEMANN-ROBINSON, *supra* note 130, at 43.

TABLE 2. FORMAL ADMINISTRATIVE ENFORCEMENT ACTIONS TAKEN BY THE COMMISSION IN THE FIELD OF ENERGY EFFICIENCY DECEMBER 2005–OCTOBER 2008<sup>166</sup>

Date	Country	Action	Directive	Reason
Apr-08	Poland	Reasoned Opinion	Ecodesign Directive	Failure to communicate transposition
Apr-08	Greece, Latvia	Reasoned Opinion	Energy Services Directive	Failure to submit a National Energy Efficiency Action Plan
Feb-08	Finland, Greece, Portugal, Luxembourg	Reasoned Opinion	Ecodesign Directive	Failure to communicate transposition
Oct-07	France, Latvia	Reasoned Opinion	Buildings Directive	Failure to notify of transposition
Oct-07	Belgium, Estonia, France, Greece, Hungary, Latvia, Luxembourg, Malta, Portugal, Slovakia, Slovenia, Sweden	Letter of Formal Notice	End-Use Energy Efficiency Directive	Failure to submit a National Energy Efficiency Action Plan
Feb-08	Belgium, United Kingdom	Referral to Court of Justice	Buildings Directive	Insufficient communication of the Directive's implementation
Oct-06	Austria, Belgium, Czech Republic, Finland, Luxembourg, The Netherlands, Slovak Republic, Spain, United Kingdom	Reasoned Opinion		
Dec-06	Slovenia	Reasoned Opinion	Buildings Directive	Failure to notify of sufficient

<sup>166</sup> This table's information was obtained from <http://europa.eu/rapid/searchAction.do>; see *supra* note 162 for full explanation.

Feb-06		Letter of Formal Notice		national implementing measures
Jul-06	France	Referral to Court of Justice	Taxation of energy products and electricity	Failure to notify of transposition measures
Mar-04		Letter of Formal Notice		
Dec-05		Reasoned Opinion		
Jun-06	Cyprus, Greece, Hungary, Malta, Sweden	Reasoned Opinion	Buildings Directive	Failure to notify of national implementing measures
Jun-07	Greece	Referral to Court of Justice	Buildings Directive	Failure to notify of national implementing measures
	Estonia, Poland	Reasoned Opinion		
Jan-06	Germany	Letter of Formal Notice	Taxation of energy products and electricity	Failure to transpose
Jul-05		Reasoned Opinion		Failure to notify of the national transposing measures
Dec-05	Portugal, Luxembourg	Referral to Court of Justice	Energy Labeling of Household Refrigerators	Failure to comply with legislation
	Luxembourg	Second Reasoned Opinion	Energy labeling of Electrical Ovens and household air-conditioners	Failure to comply with legislation

TABLE 3. COMMISSION REFERRALS TO EUROPEAN COURT OF JUSTICE  
IN THE FIELD OF ENERGY EFFICIENCY  
DECEMBER 2005–OCTOBER 2008<sup>167</sup>

Date	Case Number	Defendant	Cause	Holding
May-08	C-187/08	Belgium	Failure to adopt or notify of adequate national implementing measures to comply with Buildings Directive	Pending
July-07	C-342/07	Greece	Failure to adopt or notify of adequate laws, regulations, and administrative provisions necessary to comply with Buildings Directive	Failure to transpose
Sept.-06	C-388/06	France	Failure to adopt laws under Taxation of Energy Products and Electricity Directive	Failure to transpose
Sept.-05	C-360/05	Italy	Failure to adopt laws under Taxation of Energy Products and Electricity Directive	Failure to transpose

### C. Potential for Expanding Enforcement

As mentioned in the introduction to this section on enforcement, enforcement of EU laws actually occurs on three levels: the EU level, the Member State level, and the individual level. Given that “the state of political and financial resources invested in EC environmental law enforcement at [the] national level leaves a lot to be desired,”<sup>168</sup> and the fact that the Commission reports that it lacks the resources necessary to ensure full enforcement in the field of energy efficiency,<sup>169</sup> private enforcement actions and citizen suits present a possible but under-utilized third avenue of enforcement. In particular, an expansion

<sup>167</sup> This table’s information was obtained from <http://europa.eu/rapid/searchAction.do>; see *supra* note 163 for full explanation.

<sup>168</sup> See HEDEMANN-ROBINSON, *supra* note 130, at 159.

<sup>169</sup> The Commission estimates that it would need twenty more officials to ensure full implementation of its new Energy Efficiency Action Plan. *Working Document for Action Plan*, *supra* note 3, at 8 n.13.

of the EU concept of “direct effect,” explained below, might allow for significant improvements in enforcement of EU laws.

There are fundamental reasons why the Commission should not be the primary entity responsible for EU energy efficiency law enforcement, even aside from resource and personnel constraints. A centralized model of law enforcement has inherent limits, because a central authority will never practically be able to make systematic checks on compliance throughout the Union.<sup>170</sup> This makes the EU overly reliant on Member States to supply information on suspected violations of EU law, obviously creating a conflict of interest for Member States who are themselves liable for failing to implement EU laws.<sup>171</sup> For this reason, the Commission makes the plea that “Member States should give the regional and local authorities to which they entrust (a part of) the enforcement on the ground of EU or national regulatory measures the necessary financial and human resources to carry this out in an effective manner.”<sup>172</sup> Other possibilities are to integrate more investigatory powers into the Commission, or to give these powers to another entity to which individual citizens could report suspected violations;<sup>173</sup> these reforms, however, still run into some of the inherent challenges of choosing a centralized enforcement framework.

Recognizing these difficulties, the European Court of Justice has been expanding the notion of “direct effect.” Direct effect allows individuals to sue their Member States, in their national courts, under rights and obligations created by EU law. This area of law still has somewhat murky parameters—it is unclear what directives are to be given direct effect such that individuals can seek a remedy in national court.<sup>174</sup> However, the ECJ has recognized that those directives that create concrete obligations on Member States should be enforceable against the States by their citizens.<sup>175</sup> The critical test for whether a particular directive can be enforced by individuals is “whether the nature, background and wording of the provision in question are capable of producing

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<sup>170</sup> HEDEMANN-ROBINSON, *supra* note 130, at 162.

<sup>171</sup> *Id.* at 162–64.

<sup>172</sup> *Working Document for Action Plan*, *supra* note 3, at 14.

<sup>173</sup> See HEDEMANN-ROBINSON, *supra* note 130, at 162–63.

<sup>174</sup> *Id.* at 221–23.

<sup>175</sup> Case 9/70: Franz Grad v. Finanzamt Traunstein, 1970 E.C.R. 825, 838.

direct effects in the legal relationships between the addressee of the act and third parties.”<sup>176</sup> In the case of energy efficiency laws, no directive clearly states that it intends for individuals to have direct enforcement rights of Member State obligations; thus, it is an open question whether direct effect could be applicable to any energy efficiency laws.

Given the Commission’s recognition that it is under-equipped to deal fully with enforcing energy efficiency laws, it might consider whether writing in more provisions capable of direct effect is a politically feasible option. Writing energy efficiency directives capable of direct effect would allow EU citizens to act as a second enforcement arm much closer to the on-the-ground implementation of energy efficiency laws by Member States than the Commission can practicably be.

For now, granting direct effect remains only a possibility for achieving fuller enforcement of energy efficiency laws. In the meantime, the Commission appears to be diligently pursuing transposition of EU energy efficiency laws and, by quickly bringing enforcement actions against overdue Member States, has established that National Energy Efficiency Action Plans should be taken seriously. Beyond these obvious EU law violations, the Commission does not act as a police agent to enforce implementation on the ground, leaving this task to Member States, who diverge greatly in their enforcement capabilities. While this makes tracking full and effective implementation of energy efficiency laws difficult, it also conforms to the principle of subsidiarity underlying the EU’s governmental structure.

#### IV. FUNDING AND FINANCING ENERGY EFFICIENCY

One of the major hurdles confronting energy efficiency projects is that although projects are cost-effective over time, they require the bulk of funding at their initial stages.<sup>177</sup> The financial sector is often reluctant to finance energy efficiency projects, given

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<sup>176</sup> *Id.* at 837. For example, in the case cited, the ECJ held that a directive aimed at creating a common system of value-added taxes by a specific date could be enforced by a private citizen to challenge the taxes levied upon him by his Member State. *Id.* at 825.

<sup>177</sup> INT’L ENERGY AGENCY, SCALING UP ENERGY EFFICIENCY: BRIDGING THE ACTION GAP BACKGROUND PAPER 5 (2007), available at <http://www.iea.org/textbase/work/2007/scalingup/background.pdf>.

their high up-front costs and long payback periods, the small investments called for by most projects, and a lack of expertise in financing energy efficiency.<sup>178</sup> These barriers persist in spite of the fact that energy efficiency projects are typically characterized as low risk and as having good cash flow.<sup>179</sup>

Recognizing these financial challenges, the EU has developed a number of funding mechanisms that help energy efficiency projects overcome their financial hurdles. Yet, even after more than a decade of experience, the EU still struggles with financing as one of the largest barriers to more energy efficiency efforts.<sup>180</sup> The major strategies used to date to fund energy efficiency can be loosely grouped into public funding, market-based instruments, and supporting private financing; experience with each is briefly discussed below.

### A. Public Funding

The EU allocates some funding directly from its budget into grants for energy efficiency projects, including around 730 million euros to the Intelligent Energy Europe project discussed *supra* Part I(C)(7) and another 430 million euros to an “eco-innovation” program as part of its Entrepreneurship and Innovation Program.<sup>181</sup> These funds are given directly to specific projects, often run by a conglomeration of government agencies, universities, and in some cases private organizations.<sup>182</sup> The EU also allocates some funds to energy efficiency technological research through its Seventh Framework program for research and technological development.<sup>183</sup>

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<sup>178</sup> *Id.*

<sup>179</sup> KLINCKENBERG CONSULTANTS, THE EUROPEAN ALLIANCE OF COMPANIES FOR ENERGY EFFICIENCY IN BUILDINGS, INVESTING IN BUILDING ENERGY EFFICIENCY IN THE ENLARGED EUROPEAN UNION 1 (2006), *available at* <http://www.euroace.org/reports.htm> (follow “Investing in Building Energy Efficiency in the Enlarged European Union” hyperlink).

<sup>180</sup> Action Plan, *supra* note 30, at 16.

<sup>181</sup> Euractiv, Funding Energy Efficiency in the EU, July 10, 2007, <http://www.euractiv.com/en/energy/funding-energy-efficiency-eu/article-165378>.

<sup>182</sup> *See, e.g.*, INTELLIGENT ENERGY EXECUTIVE AGENCY, EUROPEAN COMMISSION, MULTIPLYING SUCCESS IN BUILDINGS (2006) (describing all buildings projects sponsored by Intelligent Energy Europe through 2006), *available at* <http://www.adene.pt/NR/rdonlyres/4F686BA0-0BE0-438C-8COE-1E52EDA12494/52/Multiplieringsuccessinbuildings21InnovativeProjectss.pdf>.

<sup>183</sup> Euractiv, *supra* note 181. The Seventh Framework program is the EU’s



The countries that are most in need of financial assistance for funding energy efficiency are the recently-added Member States, many of which are economies in transition (from central planning towards free market regimes) and typically have fewer national resources to devote to financing energy efficiency.<sup>184</sup> The EU's Phare<sup>185</sup> program is set up specifically to help Central and Eastern European countries transition to EU participation, through strengthening public administration, promoting strong national legislation, and helping countries achieve EU integration.<sup>186</sup>

The Phare program has helped to fund a number of innovative state mechanisms for energy efficiency financing. For example, Hungary has created an Energy Efficiency Co-financing Scheme, whereby energy efficiency projects receive loans that they repay from energy savings, with a grant from Phare used to cover the interest on the loans.<sup>187</sup> Helping Member States to come up with these types of innovative financing mechanisms is a cost-effective method of dispensing EU funds in small amounts that make measurable impacts; this is particularly important given the small size of the EU budget (less than the budget of the UK alone).<sup>188</sup>

A recent paper in *Renewable and Sustainable Energy Reviews* suggested that the EU structural funds could play a much larger

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latest comprehensive plan for research, and brings together all research-related EU initiatives under a common program, with the overarching goals of growth, competitiveness, and employment. See Europa, Seventh Framework Programme: Understand, [http://cordis.europa.eu/fp7/understand\\_en.html](http://cordis.europa.eu/fp7/understand_en.html). The program provides grants to qualifying companies, organizations, research centers, universities, and individuals for research in established areas of interest. See Europa, Seventh Framework Programme: Who, [http://cordis.europa.eu/fp7/who\\_en.html](http://cordis.europa.eu/fp7/who_en.html) (last visited Aug. 15, 2009).

<sup>184</sup> KLINCKENBERG CONSULTANTS, *supra* note 179, at 5.

<sup>185</sup> The acronym Phare stands for "Poland and Hungary Assistance for the Restructuring of the Economy." See European Parliament, Briefing No. 33, *The Phare Program and the Enlargement of the European Union* (Dec. 4, 1998), available at [http://www.europarl.europa.eu/enlargement/briefings/33a1\\_en.htm#summary](http://www.europarl.europa.eu/enlargement/briefings/33a1_en.htm#summary). It has now expanded to provide assistance to fourteen Central and Eastern European Countries, including the Czech Republic, Slovakia, Slovenia, Romania, Bulgaria, Estonia, Lithuania, and Latvia in addition to Poland and Hungary. *Id.* at Annex, available at [http://www.europarl.europa.eu/enlargement/briefings/33a3\\_en.htm](http://www.europarl.europa.eu/enlargement/briefings/33a3_en.htm).

<sup>186</sup> European Union, Phare Programme, <http://europa.eu/scadplus/leg/en/lvb/e50004.htm> (last visited Mar. 15, 2009).

<sup>187</sup> KLINCKENBERG CONSULTANTS, *supra* note 179, at 10.

<sup>188</sup> Euractiv, *supra* note 181.

role in energy efficiency.<sup>189</sup> These funds are the EU's main instrument for supporting social and economic development and reducing inequalities among regions, and amount to between 33 percent and 40 percent of the EU budget, by different estimates.<sup>190</sup> While structural funds are not currently used to finance energy efficiency, they could easily be oriented to this goal or energy efficiency could be required for all projects applying for support from the funds.<sup>191</sup> The Energy Efficiency Action Plan pledges that the Commission will encourage the use of structural funds to "facilitate leveraging of private financing at national and local levels for energy efficiency."<sup>192</sup>

Of direct relevance to developing countries is the recent creation of a Global Energy Efficiency and Renewable Energy Fund (GEEREF). This fund is designed to help overcome investment barriers for sustainable energy in developing countries and emerging economies by establishing a private-public partnership for risk sharing and co-financing.<sup>193</sup> The goal of the fund is to attract "patient" risk capital that has a long-term prospect of return on investment, mostly from banks and financial intermediaries.<sup>194</sup> The fund will initially receive eighty million euros from the Commission between 2007 and 2010, and a primary goal will be to direct this funding to investments under ten million euros, which are often ignored by traditional investors.<sup>195</sup> The Commission officially launched the fund in March 2008,<sup>196</sup> but it remains to be seen how the fund will fare in attracting

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<sup>189</sup> See Dalia Streimikiene et al., *Use of EU Structural Funds for Sustainable Energy Development in New EU Member States*, 11 RENEWABLE & SUSTAINABLE ENERGY REVIEWS 1167 (2005).

<sup>190</sup> See *id.* at 1172; Euractiv, *supra* note 181.

<sup>191</sup> See Streimikiene et al., *supra* note 189, at 1173–74.

<sup>192</sup> Action Plan, *supra* note 30, at 16.

<sup>193</sup> European Commission, *The Global Energy Efficiency and Renewable Energy Fund (GEEREF): Key Elements of the European Commission Initiative*, at 1, available at [http://ec.europa.eu/environment/climat/pdf/key\\_elements.pdf](http://ec.europa.eu/environment/climat/pdf/key_elements.pdf).

<sup>194</sup> *Id.* at 2.

<sup>195</sup> *Id.*

<sup>196</sup> Press Release, New 80 Million Euro Fund to Boost Energy Efficiency and Renewables in the Fight Against Climate Change in Developing Countries (March 28, 2008), available at <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/08/473&format=HTML&aged=1&language=EN&guiLanguage=en>.

private investment in the midst of the global financial crisis that has developed in 2008.

### B. *Market Based Instruments*

The EU is increasingly turning to market-based instruments to promote improvements in energy efficiency and environmental quality. Foremost among these is the EU Emissions Trading Scheme, discussed *supra* Part I(C)(6), which creates a market for carbon emissions allowances. However, it is debatable how much of an incentive this program creates for energy efficiency improvements in particular.<sup>197</sup> More specifically targeted to energy efficiency are the white certificates being used by Italy, the United Kingdom, and France.<sup>198</sup> White certificate programs place an obligation upon energy suppliers to help their customers implement a certain amount of annual energy savings.<sup>199</sup> Each successful energy efficiency project is awarded white certificates to represent energy saved, and each supplier must have enough white certificates (either through implementing projects or through buying certificates from other suppliers) at the end of each year to meet its annual energy savings obligation.<sup>200</sup> The EU has expressed a serious interest in white certificates and will consider whether or not to adopt an EU-wide scheme in the coming years.<sup>201</sup> The advantage of an EU-wide scheme is that a single market would be more efficient and liquid, eliminating price differences between countries and mitigating price fluctuations.<sup>202</sup> However, the general sentiment of experts both in and outside of the Commission at the current time seems to be that while white certificates are a promising option, further development and testing of such schemes needs to be done to ensure that they are both effective and cost-effective.<sup>203</sup>

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<sup>197</sup> See BERTOLDI ET AL., *supra* note 78, at 1–5.

<sup>198</sup> EURO WHITECERT PROJECT, WHITE CERTIFICATES: CONCEPT AND MARKET EXPERIENCES 3 (2007), available at [http://www.ewc.polimi.it/documents/EWC\\_brochure.pdf](http://www.ewc.polimi.it/documents/EWC_brochure.pdf).

<sup>199</sup> See *id.*

<sup>200</sup> See *id.* For a comparison of white certificates with the more familiar U.S. renewable energy credits system, see *supra* note 109.

<sup>201</sup> End-use Energy Directive, *supra* note 33, art. 4, at 69.

<sup>202</sup> Euro WhiteCert Project, *supra* note 198, at 5.

<sup>203</sup> PAOLO BERTOLDI ET AL., WHITE, GREEN, AND BROWN CERTIFICATES: HOW TO MAKE THE MOST OF THEM?, ECEEE 2005 SUMMER STUDY: WHAT WORKS

### C. Supporting Private Financing

The EU is also committed to helping engage more private financing in the energy efficiency sector.<sup>204</sup> One quasi-private institution that the EU is turning towards for greater investment in energy efficiency is the European Investment Bank (EIB). The EIB is jointly owned by the Member States and is a self-financing institution that focuses its lending efforts based on policy priorities.<sup>205</sup> In the energy field, energy efficiency is one of five priority areas that the EIB finances. In 2007, the EIB decided to raise the share of total costs that it will finance for energy efficiency projects from 50 percent to 75 percent,<sup>206</sup> which makes

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AND WHO DELIVERS? 1515, 1525 (2005), available at <http://www.ewc.polimi.it/dl.php?file=integration.pdf>. In considering a white certificate scheme, questions are also raised over how a white certificates scheme might interact with EU climate change policy, and specifically the EU ETS. A 2005 study found that current white certificates policies are unlikely to have a major impact on overall greenhouse gas emissions, given that utilities are covered by the EU ETS and would simply sell any credits saved from energy efficiency to other emitters. David Harrison, Jr. et al, European Commission Directorate General Environment, *Interactions of the EU ETS with Green and White Certificate Schemes: A Summary for Policy Makers*, at 20 (Nov. 17, 2005). However, white certificates could help lower overall emissions to the extent that they help lower household fuel consumption (a sector not covered by the EU ETS). *Id.* Moreover, the EU could decide to require utilities to retire annually a number of carbon allowances equal to the amount of carbon emissions avoided through the white certificates program (instead of allowing utilities to sell these allowances). This would ensure that white certificates contributed to additional greenhouse gas reductions on top of the EU ETS, but would raise the cost of the program as well.

<sup>204</sup> Action Plan, *supra* note 30, at 16.

<sup>205</sup> Europa, The European Investment Bank, [http://europa.eu/institutions/financial/eib/index\\_en.htm](http://europa.eu/institutions/financial/eib/index_en.htm) (last visited Jan. 28, 2009). The EIB is a unique institution: It “is a non-profit, policy driven bank. Unlike commercial banks, the EIB does not manage personal bank accounts, conduct over-the-counter transactions or provide private investment advice. The EIB makes long-term loans for capital investment projects (mainly fixed assets) but does not provide grants. The EIB is owned by the Member States of the European Union. They subscribe jointly to its capital, each country’s contribution reflecting its economic weight within the Union. The EIB does not use any funds from the EU budget. Instead, it is self-financing, borrowing on the financial markets. Because the EU Member States are the EIB’s shareholders, it carries the highest possible credit rating (AAA) on the money markets. As a result, the EIB can raise large amounts of capital on very competitive terms. As the EIB is not-for-profit, its lending conditions are equally favourable. . . . The projects the Bank invests in are carefully selected according to the following criteria: they must help achieve EU objectives; they must be economically, financially, technically and environmentally sound; they should help attract other sources of funding.” *Id.*

<sup>206</sup> The European Investment Bank, Renewable Energies and Energy

these projects feasible for a wider range of potential investors. The current Energy Efficiency Action Plan commits the Commission to “call upon the banking sector to offer finance packages specifically aimed at small and medium enterprises,” specifically through more public-private partnerships between the private banking sector and the EIB.<sup>207</sup> This goal will likely prove increasingly challenging as the EU struggles with how to manage a major credit crunch in late 2008.<sup>208</sup>

In addition, the Commission recognizes the important role that Energy Service Companies (ESCOs) can play in funding energy efficiency improvements. ESCOs help design, finance, and implement energy efficiency projects for energy users and then share in the energy savings achieved in order to recoup costs and earn a profit.<sup>209</sup> Typical ESCO-run projects include replacement of inefficient heating and cooling equipment, re-designed lighting, improvement of industrial processes for energy savings, and installation of cogeneration.<sup>210</sup> The Commission has long been promoting the ESCO industry,<sup>211</sup> and it is expected that the End-

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Efficiency, <http://www.eib.org/projects/topics/environment/renewable-energy/index.htm> (last visited Jan. 28, 2009).

<sup>207</sup> Action Plan, *supra* note 30, at 16.

<sup>208</sup> See *Managing the Credit Crunch: The European Union's Week from Hell*, ECONOMIST, Oct. 9, 2008, at 69.

<sup>209</sup> See PAOLO BERTOLDI & SILVIA REZESSY, ENERGY SERVICES COMPANIES IN EUROPE 17–18 (2005), available at <http://re.jrc.ec.europa.eu/energyefficiency/> (click on hyperlink for “Publications” and a PDF version of the study is available under “Reports”). This report does an excellent job of explaining in detail the financing schemes that are successfully employed by ESCOs and the status of ESCO development in each Member State, and might prove a good reference if more specific information on ESCO structure and function is desired. A 2007 update to the report is also available, with more detailed country summaries. See PAOLO BERTOLDI ET AL., LATEST DEVELOPMENT OF ENERGY SERVICES COMPANIES ACROSS EUROPE (2007), available at [http://www.energy.eu/publications/LBNA22927ENC\\_002.pdf](http://www.energy.eu/publications/LBNA22927ENC_002.pdf).

<sup>210</sup> See Paolo Bertoldi, Silvia Rezessy & Edward Vine, *Energy Service Companies in European Countries: Current Status and a Strategy to Foster Their Development*, 34 ENERGY POL'Y 1818, 1823–25 (2006).

<sup>211</sup> Specific historical policies are outlined in BERTOLDI & REZESSY, *supra* note 209, at 15: “The European Commission has long been promoting the ESCO industry and TPF” (third party financing) since it first recommended their promotion to Member States in 1988. “In 1992, the European Council and Parliament adopted a Directive (93/76/EC), which invited Member States to design and implement programmes to use TPF in the public sector. Under the European Commission’s THERMIE and SAVE programs, several studies and pilot projects were implemented to promote ESCO and TPF activities, mainly in public buildings and combined heat and power (CHP). In 1996, two standard

Use Efficiency Directive will further its activities. Specifically, the directive is designed to facilitate and stimulate more investment in energy efficiency, and requires Member States to remove barriers to ESCOs<sup>212</sup> and third party financing.<sup>213</sup>

Unsurprisingly, major differences exist among Member States in the degree of development of their ESCO industries. On the whole, the ESCO industry was found to be “in its infancy stage and . . . struggling to get off the ground” as of 2005, except in Germany, Austria, Hungary, and France.<sup>214</sup> Since then, major gains have been made in the development of the ESCO industry across Europe, and particularly in new Member States. But some countries still lag far behind.<sup>215</sup> Major causes of these divergences include levels of support given by national and regional authorities and variations in market structures and rules.<sup>216</sup> To promote further use of the ESCO industry across Europe, Commission experts came up with a number of policy recommendations in their 2005 analysis: increasing dissemination of information about services offered by ESCOs; launching an accreditation system for ESCOs to ensure that companies calling themselves ESCOs are qualified and reliable; developing financing capabilities and incentives in local markets that allow ESCOs to get off the ground and become capable of providing their own working capital;

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ESCO-type contracts were published—for buildings and for industry—in all the languages of the EU. In 2002, the European Commission’s GreenLight Program identified ESCOs operating in the lighting field, and created a preliminary list of ESCOs . . . . More recently, in 2003, the European Commission DG JRC conducted a survey of ESCOs in the EU, resulting in the creation of the first online EU database of ESCOs.”

<sup>212</sup> Some common barriers to ESCOs that exist in many Member States are low awareness and lack of understanding of ESCO services; administrative services including complicated procedures and high transaction costs, and high perceived risk and skepticism among ESCO clients (likely closely linked to the lack of awareness and understanding). See BERTOLDI ET AL., *supra* note 209, at 85–86.

<sup>213</sup> Third party financing is one way in which an ESCO finances energy efficiency improvements for its customers, by borrowing the necessary capital from a third party and paying it off gradually through the energy savings achieved. See generally Directorate-General for Energy & Transport, European Commission, *Third Party Financing of Energy Efficiency in Industry, Structuring of Pilot Projects in Poland, Austria, Norway and Spain* (Dec. 2000), available at [http://www.energyagency.at/publ/pdf/tpfind\\_en.pdf](http://www.energyagency.at/publ/pdf/tpfind_en.pdf).

<sup>214</sup> BERTOLDI & REZESSY, *supra* note 209, at 3.

<sup>215</sup> See BERTOLDI ET AL., *supra* note 209, at 79.

<sup>216</sup> BERTOLDI & REZESSY, *supra* note 209, at 3.

standardizing monitoring and verification of energy savings; promoting public sector use of ESCO services; and developing a third-party financing network throughout Europe that would bring together financial institutions, energy suppliers, and ESCOs to share best practices and coordinate the effort towards greater market penetration of ESCOs.<sup>217</sup>

On the whole, the EU's energy efficiency financing goals appear to be two-fold: better targeting of the limited public funding available to particularly needy and high-yielding projects, and better harnessing of private incentives as the more realistic source of most energy efficiency financing for the future. Given some of the continuing struggles of implementing and enforcing efficiency laws, pursuing financing as more of a "carrot" strategy as opposed to the more traditional "stick" strategy will be an important component of the overall success of energy efficiency improvements. Hopefully, as the EU works to update and strengthen its energy efficiency policy and to achieve its Action Plan, implementation, enforcement, and financing will all continue to improve. In the meantime, there are a number of lessons to be drawn from the EU's experience to date.

## V. TRANSFERRING THE LESSONS FROM THE EU TO CHINA

This final section of the note focuses on how the lessons learned from the EU's experience in developing, implementing, and enforcing energy efficiency laws might be transferred to China. This focus on implementation, enforcement, and financing is particularly critical in China, where the National People's Congress has enacted seemingly strong energy efficiency laws that are in fact woefully under-implemented and under-enforced at the local level.<sup>218</sup> While the differences between the EU and China in many respects seem staggering, especially as measured by their relative stages of economic development and environmental protection, their institutional structures are in some ways similar and offer an opportunity to export lessons learned from the EU to China. The similarities and differences between the EU and China are highlighted in the first part of this section that focuses on

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<sup>217</sup> See BERTOLDI ET AL., *supra* note 209, at 57–60.

<sup>218</sup> See, e.g., Mingyuan, *supra* note 7, at 227–28 (suggesting that a lack of implementation and enforcement is critical to the under-success of national energy efficiency laws).

Chinese laws and institutions. Subsequent subsections detail recommendations for how China might improve implementation, enforcement, and financing based on the lessons the EU has learned in these areas.

### A. *Institutions and Law*

#### 1. *Institutions*

China is unhampered by some of the institutional barriers that stand in the way of the EU's ability to formulate comprehensive energy laws because China is a single nation with power vested in the National People's Congress to formulate all "fundamental" national legislation.<sup>219</sup> Recall that the EU's principle of subsidiarity constrains the EU from passing detailed, mandatory measures at the Union-level. China's ability to pass more specific commands at the central level could be a major advantage over the EU's structure—centralized mandates may in many situations enhance oversight and create clearer objectives for local governments to implement. Nevertheless, in practice China's central government has devolved much authority to the local level, placing these governments in primary control of interpreting and implementing what are often vague, largely aspirational national laws.<sup>220</sup> Provincial governments, and a few municipal governments, are also given the ability to formulate their own laws and regulations provided that they do not contravene national laws.<sup>221</sup> Local Environmental Protection Bureaus (EPBs) are typically the entities responsible for actually implementing environmental laws, and are answerable to the national environmental agency (SEPA, or the State Environmental Protection Agency).<sup>222</sup> But, these EPBs are under the direct control of their local governments, upon which they rely for funding, budgets, promotions, and even housing and office

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<sup>219</sup> Richard J. Ferris, Jr. & Hongjun Zhang, *Environmental Law in the People's Republic of China*, in CHINA'S ENVIRONMENT AND THE CHALLENGE OF SUSTAINABLE DEVELOPMENT 66, 69 (Kristen A. Day ed., 2005).

<sup>220</sup> Elizabeth Economy, *Environmental Enforcement in China*, in CHINA'S ENVIRONMENT AND THE CHALLENGE OF SUSTAINABLE DEVELOPMENT 102, 103 (Kristen A. Day ed., 2005); Sitaraman, *supra* note 8, at 310.

<sup>221</sup> Ferris & Zhang, *supra* note 219, at 73.

<sup>222</sup> Sitaraman, *supra* note 8, at 309–10.



space.<sup>223</sup> Thus, the loyalty of the EPB is typically primarily to the local governments, which often are “more interested in promoting economic growth and increasing industrial production rather than enforcing SEPA policies that are viewed as anti-growth.”<sup>224</sup>

The vesting of provinces with implementation and enforcement responsibility makes China’s law creation and enforcement mechanisms in practice resemble the EU’s fairly closely—a central authority passes broad overarching laws, but lower levels of government are charged with the majority of the implementation and the enforcement work. Thus, both the EU and China face the challenge of how to ensure that centrally passed laws are implemented properly by Member States or provinces with vastly different geographical and financial situations and varying levels of commitment to environmental objectives.<sup>225</sup>

Despite these similarities, the institutions in charge of implementing national/Union-wide energy efficiency laws in China and the EU are quite different. In the EU, responsibility is vested almost entirely within the European Commission’s Directorate-General for Transportation and Energy (DG-TREN), with technical research responsibilities shared with the Commission’s Directorate-General for Research.<sup>226</sup> This arrangement ensures that energy efficiency policy is contextualized and implemented within overall energy policy, as DG-TREN is responsible for the entirety of EU Energy Policy.<sup>227</sup> In contrast, even at China’s central level alone, one researcher catalogued eight ministries and eleven departments currently involved in the formulation of energy policy.<sup>228</sup> This split

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<sup>223</sup> *Id.*

<sup>224</sup> *Id.* at 310. *See also* Mingyuan, *supra* note 7, at 236–37 (discussing the fact that many Chinese localities and departments rank energy efficiency very low on the list of priorities, viewing it as a thankless investment).

<sup>225</sup> *See* Sitaraman, *supra* note 8, at 309–10.

<sup>226</sup> *See* European Commission, Directorate-General for Energy and Transport, [http://ec.europa.eu/dgs/energy\\_transport/index\\_en.htm](http://ec.europa.eu/dgs/energy_transport/index_en.htm) (last visited Mar. 18, 2009); European Commission, Research Directorate-General, [http://ec.europa.eu/dgs/research/index\\_en.html](http://ec.europa.eu/dgs/research/index_en.html) (last visited Mar. 18, 2009).

<sup>227</sup> *See* Directorate-General for Energy and Transport, *supra* note 17.

<sup>228</sup> Jimin Zhao, *Reform of China’s Energy Institutions and Policies: Historical Evolution and Current Challenges* 10–11 (BCSIA Discussion Paper 2001–20, Energy Technology Innovation Project, Kennedy School of Government, Harvard University, 2001), available at <http://belfercenter.ksg.harvard.edu/files/zhao.pdf>.

responsibility has reportedly made progress on energy efficiency laws difficult.<sup>229</sup> China's Energy Conservation Law (ECL) vests central authority over energy efficiency in the administrative department for energy conservation under the State Council, but less clearly calls for "[t]he departments concerned under the State Council [to] be responsible for energy conservation supervision and administration within the scope of their respective functions . . . ."<sup>230</sup>

The structural similarities but factual differences between China's and the EU's energy efficiency administrations offer several suggestions for China. As it works to implement its revised ECL in the coming years, a few lessons that China might draw from the EU's experience with its energy efficiency institutions include:

1. **Work to keep the administrative department for energy conservation from being marginalized.** One key factor that has helped the European Commission prioritize energy efficiency and achieve significant savings is the fact that energy efficiency has not been marginalized and has remained within the purview of the same authorities responsible for implementing overall energy policy. While a delegation to a separate administrative department for energy conservation in China's central government may be a necessity, the more this Authority is integrated into the overall energy policy-making body, the more energy efficiency is likely to be considered a viable energy supply option.
2. **Consolidate powers.** Another institutional lesson that the EU has to offer is that **vesting one agency with legislative, implementing, and enforcement authority leads to greater effectiveness and accountability.** The European Commission drafts energy efficiency laws, oversees their implementation by Member States, and has full enforcement powers. These broad-ranging

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<sup>229</sup> *Id.* See also ELIZABETH C. ECONOMY, THE RIVER RUNS BLACK: THE ENVIRONMENTAL CHALLENGE TO CHINA'S FUTURE 103–04 (2004); Mingyuan, *supra* note 7, at 229.

<sup>230</sup> Energy Conservation Law (promulgated by the Standing Comm. Nat'l People's Cong., Nov. 1, 1997, amended Nov. 28, 2007), art. 10 (P.R.C.) (unofficial translation) (LawInfoChina.com through Nov. 28, 2007 amendment).

competencies empower the Commission to follow through on energy efficiency policy from beginning to end, and enable those tracking implementation to hold a single agency accountable for successes or failures.

## 2. Law

Given China's relatively high energy intensity (recall that it uses five times more energy per dollar of GDP than the EU, and four times more than the US),<sup>231</sup> there is an enormous potential for energy savings. China has recognized this, and in its most recent five-year plan it has set forth a goal of reducing its energy use per GDP 20 percent by 2010.<sup>232</sup> This goal is incredibly ambitious, and will depend primarily on reforms in the industrial sector.<sup>233</sup> China's industries consume close to 60 percent of total national energy demand, and are full of outdated production processes with low efficiency.<sup>234</sup> There is also tremendous potential for efficiency improvements in buildings, which will be critical as China's recent rapid growth has caused general energy demand to rise as more people can afford larger homes and more electricity-consuming appliances.<sup>235</sup> At least at the national level, China has recognized the tremendous opportunities presented for energy saving and has responded with ambitious laws. Current strategies include numerous labeling laws and regulations,<sup>236</sup> building codes,<sup>237</sup> and

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<sup>231</sup> See *supra* note 5 and accompanying text.

<sup>232</sup> INT'L ENERGY AGENCY, CHINA'S QUEST FOR ENERGY EFFICIENCY 1 (Working Paper, June 2006), available at <http://www.iea.org/Textbase/work/2006/gb/papers/ChinaQuest.pdf>.

<sup>233</sup> *Id.*

<sup>234</sup> WANG YANJIA, ENERGY EFFICIENCY POLICY AND CO<sub>2</sub> IN CHINA'S INDUSTRY: TAPPING THE POTENTIAL 1 (2006), available at <http://www.oecd.org/dataoecd/58/28/36321399.pdf> (draft report prepared for the Annex I Expert Group Seminar in Conjunction with the OECD Global Forum on Sustainable Development, held on March 27, 2006).

<sup>235</sup> JIANG LIN ET AL., LAWRENCE BERKELEY NAT'L LABORATORY, ACHIEVING CHINA'S TARGET FOR ENERGY INTENSITY REDUCTION IN 2010: AN EXPLORATION OF RECENT TRENDS AND POSSIBLE FUTURE SCENARIOS 22 (2006), available at <http://eetd.lbl.gov/ea/china/publications/lbnl-61800.pdf>.

<sup>236</sup> See, e.g., LIN JIANG ET AL., OFFICE OF SCIENTIFIC AND TECHNICAL INFORMATION, U. S. DEPARTMENT OF ENERGY, REP. NO. LBNL-50416, ENERGY EFFICIENT APPLIANCE LABELING IN CHINA: LESSONS FOR SUCCESSFUL LABELING PROGRAMS IN VARIED MARKETS 4 (2001), available at <http://www.osti.gov/bridge/servlets/purl/823725-8ZjLYT/native/823725.pdf>.

<sup>237</sup> See LIN ET AL., *supra* note 235, at 14.

laws targeting industrial efficiency.<sup>238</sup> Energy efficiency has been primarily governed by the Energy Conservation Law since its 1998 passage.<sup>239</sup> In 2007, the Chinese government reaffirmed its commitment to energy efficiency by passing an updated version of this law<sup>240</sup> with stronger regulations for transportation and construction and improved administrative oversight.<sup>241</sup>

This note is primarily concerned with how China can better implement, enforce, and finance its energy efficiency laws as a whole. Because of this broader focus, this note will not attempt to describe and catalogue the numerous laws and standards in this area. While its numerous laws and its ambitious national energy efficiency targets make it seem as though China has come far in its energy efficiency policy, the critical challenge for China, with its powerful central Congress, is not passing ambitious measures. Rather, implementation and enforcement of these laws will be paramount to getting these tools to work in China—a revised and tightened but still largely hortatory ECL will otherwise have little practical effect.<sup>242</sup> Recommendations on how to move from good laws on paper to good laws in practice is the topic of the following subsection on implementation.

### B. Implementation

The harshest criticism of China's 1998 Energy Conservation Law (ECL) is that it has been reduced "to a mere scrap of paper."<sup>243</sup> Others have asserted more mildly that the law is "based on clear principles but lack[s] implementation details," and is implemented to widely varying degrees among provinces.<sup>244</sup>

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<sup>238</sup> See, e.g., YANJIA, *supra* note 234, at 22–26 (describing several strategies that China has developed for improving energy efficiency in industry).

<sup>239</sup> *Id.* at 24.

<sup>240</sup> Energy Conservation Law, *supra* note 230, art. 10.

<sup>241</sup> See Siobhan Devine, *Analysis: China Conservation Doubts Remain*, UNITED PRESS INT'L, Feb. 22, 2008, available at [http://www.upi.com/Energy\\_Resources/2008/02/22/Analysis\\_China\\_conservation\\_doubts\\_remain/UPI-84921203712077/](http://www.upi.com/Energy_Resources/2008/02/22/Analysis_China_conservation_doubts_remain/UPI-84921203712077/).

<sup>242</sup> See Mingyuan, *supra* note 7, at 227–28 (suggesting that the goals and aims of the ECL are far from being achieved, due largely to a lack of implementation and enforcement). See also Devine, *supra* note 241 (quoting Barbara Finamore of NRDC's China Clean Energy project as explaining that the revised ECL's effectiveness "is going to depend on how well it is implemented.").

<sup>243</sup> Mingyuan, *supra* note 7, at 228.

<sup>244</sup> YANJIA, *supra* note 234, at 2.

Commentators seem to agree that there is a serious gap between the law as written and the law as applied, which is problematic given that the ECL depends upon “forceful execution of the supervisory and managerial duties of the government.”<sup>245</sup> Key problems with the ECL include that it is “overly principle-oriented, lacking, or weak, in terms of enforcement measures;” it imposes no political supervision or accountability; and it has very vague and soft language.<sup>246</sup> On the whole, one report estimates that “only 6 percent of its articles have been implemented sufficiently, 60 percent have been poorly implemented and 34 percent have not been implemented at all.”<sup>247</sup> Furthermore, implementation varies widely among provinces and municipalities—whereas Shanghai has established an effective Energy Conservation Supervision Center that is locally financed, poorer provinces struggle to create effective bureaucracies and place energy efficiency low on their list of priorities.<sup>248</sup> One of the reasons for this disparity is that the national government reportedly gives little guidance on how to implement its largely hortatory, vague energy efficiency laws.<sup>249</sup>

The EU is far from perfect in the implementation of its energy efficiency laws, but its years of practice do provide some suggestions as to how implementation strategies used in the EU might be helpful to China:

1. **Create more accountability between the ‘layers’ of government.** China, just like the EU, has a multi-layered institutional structure with territorial divisions at the centre, province, city, county, township, and village levels.<sup>250</sup> Unlike the EU, though, its energy efficiency laws leave interpretation to local governments and do not provide much accountability of local governments to the central government to ensure implementation and enforcement.<sup>251</sup> Having the national government authority

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<sup>245</sup> Mingyuan, *supra* note 7, at 226.

<sup>246</sup> *Id.* at 231–32; *see also* YANJIA, *supra* note 234, at 2.

<sup>247</sup> Qingyi, *supra* note 7, at 97 (*citing* Wang Qingyi, *Ten Issues Regarding Energy Conservation in China*, CHINA ENERGY, No. 5, 17 (2005)).

<sup>248</sup> *See* Mingyuan, *supra* note 7, at 234 & n.41, 237.

<sup>249</sup> Cummings, *supra* note 4, at 10545.

<sup>250</sup> *See* Sitaraman, *supra* note 8, at 310.

<sup>251</sup> *See, e.g., id.* at 309–11 (explaining that local EPBs, though nominally responsible to SEPA, are actually under the almost full control of the local

focus its efforts on monitoring local agencies, rather than on directly inspecting implementation at the facility level, would allow more efficient use of limited national monitoring resources. Similarly, requiring careful reporting of goals and progress from local government agencies to the national government would create more accountability between layers of government.

2. **Require (or at least strongly encourage) formulation of local regulations and bylaws that transform the more hortatory national laws into concrete local obligations.** The EU's requirement that all Member States transpose EU-level directives into national law allows the Commission to directly track implementation and interpretation of its EU directives by each Member State. Given that more than twenty provinces, autonomous regions, and municipalities have already promulgated up to seventy bylaws on energy efficiency,<sup>252</sup> this same requirement appears feasible in China, at least with the proper technical support at the national level.
3. **Focus on building institutional capacity and training individuals in energy efficiency in laggard provinces, municipalities, and autonomous regions.** The EU has shared the same struggle as China in achieving even implementation of its energy efficiency laws across Member States, with many poorer Member States struggling to create and fund local agencies capable of ensuring compliance. While the EU is not a paradigm for dealing with this problem, it has redoubled its efforts to help bring laggard Member States up to speed. Ways in which this can be done include **training local experts and providing templates and best practices for the form that exemplary local bylaws and regulations might take.** This might be modeled on Intelligent Energy Europe's "Implementing EU Appliance Policy in Central and Eastern Europe" Program, discussed *supra* Part I(C)(7).

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governments and suggesting that this problem is because of a lack of control of SEPA over local EPBs).

<sup>252</sup> Mingyuan, *supra* note 7, at 234.

4. **Require provinces, autonomous regions, and municipalities to issue periodic progress reports and provincial/regional/municipal energy efficiency plans to the national Energy Conservation Authority. Require these plans to contain an evaluation of the implementation of all national energy efficiency laws to date, progress on any targets set, and a plan for future concrete steps to achieve these targets.** The revised ECL calls for annual reports from local governments,<sup>253</sup> the more clear the planning and evaluative responsibilities are for these reports, the more effective they are likely to be. While not directly imposing any new binding requirements themselves, these sorts of progress reports have proven very helpful in allowing the Commission to track implementation progress in each Member State, reducing the amount of direct investigatory work that the Commission must itself perform.
5. Do not use the generalities contained in EU laws as a drafting guide—**formulate complementary rules, specifications, standards, and guidelines at the national level that help transform the sometimes vague goals of the ECL into more concrete obligations where national uniformity in implementation is a desired goal.** Unlike the EU, China has the constitutional ability to impose direct, discrete regulatory obligations as part of its national law.<sup>254</sup> For areas where this sort of national uniformity is desirable, China could far surpass the EU in terms of the specificity of its laws. This is particularly true in areas that prove very controversial yet are easy to monitor for compliance, such as energy taxation laws.
6. **Make national technical expertise available to local authorities for technically complex issues.** The EU found that one of the key reasons that its Buildings Directive had not been implemented was that there was a lack of technical expertise at the Member State level to formulate and implement appropriate national standards. For implementation problems that are predominantly technical

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<sup>253</sup> Energy Conservation Law, *supra* note 230, art. 5.

<sup>254</sup> Hilary K. Josephs, *Measuring Progress Under China's Labor Law: Goals, Processes, Outcomes*, 30 COMP. LAB. L. & POL'Y J. 373, 377 (2008).

in nature, a small staff of national experts acting as consultants and trainers could efficiently overcome local technical hurdles to local implementation.

### C. Enforcement

Both the EU and China have struggled and continue to struggle with enforcement of energy efficiency laws. China's ECL in particular has been criticized for failing to provide any real enforcement mechanisms—the law fails to clearly delegate implementation or enforcement responsibilities and does not provide punitive penalties for violations.<sup>255</sup> In this respect, the EU can provide a useful guide through its struggles in getting Member States to internalize the responsibility for enforcing EU laws. The EU's main enforcement leverage has come from building an intermediary enforcement mechanism into its laws, whereby the central EU government can take enforcement action against non-compliant Member States. Of course, such an intra-governmental enforcement mechanism works only to the extent that there is the political will at the central level to ensure provincial compliance.<sup>256</sup> If China's central government is in search of nothing more than lip service to energy efficiency, few recommendations from the EU will help it move towards stronger implementation and enforcement.<sup>257</sup> However, to the extent that the central government actually wants to ensure achievement of its energy efficiency goals and devotes resources to doing so, a few lessons can be drawn from the EU's experience that might help ensure successful enforcement:

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<sup>255</sup> See Mingyuan, *supra* note 7, at 233.

<sup>256</sup> One recent article suggests that enforcement challenges stem from a combination of factors within and without of the central government's control. See Adam Briggs, Note, *China's Pollution Victims: Still Seeking a Dependable Remedy*, 18 GEO. INT'L ENVTL. L. REV. 305, 315–16 (2006). To the extent that enforcement challenges stem from the "imprecise and often over-ambitious texts of the laws themselves" and a lack of resources at the central government level, *id.* at 312, only a more tangible commitment to energy efficiency at the central level can fix these problems. However, the problem is also largely driven by a "lack of willingness by self-interested local officials to enforce national laws at the local level," *id.*, and the E.U. does have some valuable insights to suggest ways of coping with this problem.

<sup>257</sup> See, e.g., Sitaraman, *supra* note 8, at 273 (suggesting that one major problem facing China is "political unwillingness to undertake strong enforcement measures and prioritize environmental protection ahead of economic growth" despite a willingness to record strong formal laws).



1. **Place concrete obligations directly on lower bodies of authority (i.e. provincial authorities), not simply on private entities, to create a direct enforcement chain.** The central authority cannot realistically expect to monitor compliance and enforce the law against all non-compliant private entities. Recognizing this, the EU has chosen to focus its enforcement efforts at the intermediary stage of Member State obligations.
2. **To the extent feasible, create enforcement capabilities for the national body in charge of enforcing energy efficiency laws against the local authorities in charge of implementing the laws.** The European Commission's ability to bring Member States to the European Court of Justice has proven a powerful negotiating tool, enabling the Commission informally to ensure Member State compliance with the laws in almost all cases. A similar ability to take enforcement action against non-compliant provinces and to use the threat of such actions as a bargaining tool would empower much more intra-governmental enforcement authority between national and local administrators. Including implementation timelines within energy efficiency laws has enabled the EU to be particularly successful in tracking implementation at the Member State level and in bringing enforcement actions against those countries lagging behind in implementation.
3. **Enforcement power works best when it is not confined to the national government and local authorities; legitimate private enforcement rights will ultimately be the most effective enforcement tool.** The EU has struggled tremendously to actually achieve on-the-ground implementation of its energy efficiency laws—while the Commission takes action against Member States failing in their major obligations, it simply does not have the enforcement capabilities (and some argue, nor should it) to monitor local action on the ground across the EU. The EU has no good model to offer of private enforcement rights for energy efficiency, given that it chose not to create a direct right for private enforcement within its laws, and the ability to enforce these directives in national court absent a direct right is questionable. However, the EU's experience

does suggest that fostering greater individual enforcement by the public will be a critical component of achieving more robust enforcement of energy efficiency laws. Admittedly, the possibility of private rights of enforcement, namely through citizen suits, is still remote in China. However, a few environmental attorneys are experimenting with bringing suits and interest is growing in the use of the mechanism.<sup>258</sup> While not a likely major avenue for near-term enforcement, many believe that the US's success with citizen suits (and, conversely, the EU's struggles in the absence of such suits) does offer valuable lessons to China in terms of future enforcement possibilities.<sup>259</sup>

#### D. *Financing*

Financing is often the critical hurdle for cost-effective energy efficiency projects actually getting off the ground—while it seems counterintuitive that cost-effective projects would not be implemented, the up-front costs and long payback times make a solid financing scheme an essential part of any energy efficiency strategy. The EU is still in the process of developing good energy efficiency financing practices, but is far enough along in experimenting with various options that it offers some good financing lessons:

1. **Target funds where they are most needed. Help empower poorer provinces and smaller projects to take advantage of international funding opportunities.** The EU has recognized that it has countries with extremely divergent financing capabilities, and has increasingly targeted its aid towards those Member States most in need of assistance. Particularly for China, there is a large amount of international funding available for financing

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<sup>258</sup> See Patti Goldman, *Public Interest Environmental Litigation in China: Lessons Learned from the U.S. Experience*, 8 VT. J. ENVTL. L. 251, 253 (2007); Robert V. Percival, *Environmental Law in the Twenty-First Century*, 25 VA. ENVTL. L.J. 1, 24 (2007).

<sup>259</sup> See Briggs, *supra* note 256, 325–26; Barbara Finamore, Maria McFarland & Wallace Showman, *The Unprotected Environment: Case Studies Illustrating the Need for New Solutions*, 15 FORDHAM ENVTL. L. REV. 428, 435 (2004); Percival, *supra* note 258, at 24–25.

projects, but reports suggest that those municipalities most successful at obtaining international funds are the most environmentally conscious and active cities (Shanghai, Zhongshan, Dalian) that already have strong ties with the international community.<sup>260</sup> As the EU has done, China might choose to target domestic aid towards poorer provinces and to help these provinces improve their ability to obtain international funding.

2. **Stretch relatively little public money to cover a large number of projects by using it innovatively.** The EU's Phare Program's co-financing scheme, whereby public money covers only the interest that an energy efficiency project would otherwise pay, offers one model for effectively using relatively small amounts of public funding.<sup>261</sup>
3. **Encourage the development of ESCOs by dialoguing with them about policy barriers<sup>262</sup> that exist to their ideal functioning.** The EU has been increasingly successful in helping ESCOs to succeed, largely through surveying existing companies and addressing their policy concerns. China, in its preliminary stages of ESCO development,<sup>263</sup> could similarly help to remove some of the key barriers to entry that its early ESCOs have experienced. The revised ECL "encourages" the development of ESCOs,<sup>264</sup> but more concrete measures may be needed to help these entities enter the market. For example, the EU has found that subsidies, dissemination of information and capacity building, national accreditation of ESCOs to enhance their credibility, and helping ESCOs

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<sup>260</sup> ECONOMY, *supra* note 229, at 120.

<sup>261</sup> This project is discussed in more detail *supra* Part IV(A).

<sup>262</sup> Some of the key barriers identified in the EU through surveying ESCOs include low awareness and lack of information about ESCOs, client skepticism, high perceived risk, high administrative hurdles and transaction costs, split incentives, and availability of financing. See BERTOLDI ET AL., *supra* note 209, at 85–86. The barriers in China may prove to be similar to these, but a survey of existing ESCOs in China could more reliably pinpoint the precise challenges confronted there.

<sup>263</sup> YANJIA, *supra* note 234, at 39.

<sup>264</sup> Energy Conservation Law, *supra* note 230, art. 22.

acquire third-party financing have all contributed to the growing success of ESCOs in the EU.<sup>265</sup>

4. **Require energy efficiency to be a component of any national government-funded project.** While the EU has not built this requirement into its allocation of Structural Funds, experts suggest that this would be an excellent way to make energy efficiency more of a priority in EU-funded actions.<sup>266</sup>
5. **Better align energy prices with energy costs.** The EU has struggled with implementing minimum energy taxes, but has found more support from Member States for market-signaling options such as real time pricing. Any steps that can be taken to have energy prices better reflect the true cost of energy consumption will help promote further energy efficiency. China might also carefully monitor the EU's upcoming deliberations on whether to use white certificates for energy efficiency, though it probably should not yet opt in to this nascent market mechanism.<sup>267</sup>

## CONCLUSION

Both China and the EU have a long way to go in achieving complete implementation of their laudable energy efficiency goals. However, in its first fifteen years of implementing energy efficiency policy, the EU has made impressive improvements and developed increasingly effective implementation, enforcement, and financing strategies. As China's demand for energy burgeons over the next few decades, any and all steps that it can take to make energy efficiency a major part of its energy supply mix will have positive impacts on its environment and economy. Moreover, given that China is expected to account for 20 percent of the increased global energy demand and half the increased demand in

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<sup>265</sup> See BERTOLDI ET AL., *supra* note 209, at 87–89.

<sup>266</sup> See, e.g., Streimikiene et al., *supra* note 189, at 1174.

<sup>267</sup> This is both because the white certificate is a nascent, unproven market mechanism just gaining traction in Europe and not yet experimented with on a large scale, and because China probably still lacks the institutional capacity to run a white certificate program. See generally Ruth Greenspan Bell, *What to Do About Climate Change*, FOREIGN AFF., May–June 2006, at 105, 112 (arguing that countries like China are not ready to implement Western economic tools like emissions trading—and by extension, white certificates—until assistance is provided “to build effective monitoring, inspection, and enforcement practices”).

coal over the next thirty years,<sup>268</sup> any improvements in its energy efficiency will have important effects on global energy supply and prices and worldwide levels of greenhouse gas emissions. But, the devil is in the details—the real challenge for both the EU and China is in transforming what they have already realized are excellent policy goals into fully implemented solutions across all levels of government. This note's goal has been to discuss some of the details that have plagued the EU and, by identifying these problems and any solutions that have been found, help China 'leap-frog' some of the challenges that the EU has encountered.<sup>269</sup> These lessons that EU has learned in implementing, enforcing, and financing its energy efficiency policy have the potential to help China move from broad national goals to concrete local implementation more quickly and effectively.

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<sup>268</sup> ANGIE AUSTIN, ENERGY AND POWER IN CHINA: DOMESTIC REGULATION AND FOREIGN POL'Y 5 (Foreign Pol'y Ctr. 2005), *available at* <http://fpc.org.uk/publications/153> (citing IEA statistics).

<sup>269</sup> *Cf.* Cummings, *supra* note 4, at 10526.