

Europe's Regulations at Risk

The Environmental Costs of the TTIP



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1. EXECUTIVE SUMMARY

1.1. Regulatory background: How much is at stake?

The European Union and the United States are negotiating a proposed trade liberalization treaty, the Transatlantic Trade and Investment Partnership (TTIP). Supporters of the treaty suggest that it will bring big economic gains to both Europe and America; a widely cited study estimates annual gains for the EU of €68 – 119 billion¹. Reduction of tariffs, the traditional form of trade liberalization, plays only a small part in the plans for TTIP, since average tariffs on EU-US trade are already less than 3 percent.

The projected benefits of TTIP are based almost entirely on removal of “non-tariff barriers to trade.” Bureaucratic and regulatory obstacles are said to limit trade at present; TTIP would remove these obstacles, by harmonizing standards in the EU and the US. In such a process, it will be hard to avoid downward harmonization, adopting the weaker of European or American standards.

If TTIP led to downward harmonization, what would be lost? Regulations are not arbitrary bureaucratic impediments to business. Rather, they are often designed to protect human health and well-being, sustainable communities, and the natural environment. The EU has adopted a precautionary approach to protection of health and environment, while the US, since the 1990s, has increasingly demanded that regulations be justified by cost-benefit calculations. The result is frequently that American standards are weaker, so that downward harmonization would mean adopting the US position.

Many of the benefits of European regulations, while of obvious importance, are difficult or impossible to express in monetary terms. This occurs in part because precautionary regulations are often designed to avoid rare but costly disasters. What is the monetary value of reducing the likelihood of outbreaks like mad cow disease, worst-case toxic chemical exposures such as PCBs or asbestos, or catastrophic climate risks?

A number of studies have estimated the overall value of the benefits of European regulations, or health and environmental costs that could be addressed by future regulations, yielding estimates that are comparable to or larger than the estimated gains from TTIP.

- A 2011 study estimated that the costs of not yet meeting EU standards for 2020 in six areas of regulation – waste, biodiversity and nature, water quality, air quality, chemicals policy, and noise – amounted to €200 – 300 billion per year. The costs of failure to meet standards already in effect in 2011 was estimated at €50 billion per year.
- The burden of disease costs attributable to endocrine-disrupting chemicals in the EU has been estimated at €157 billion per year.
- The European Environment Agency values the health effects of industrial air pollution, excluding climate impacts, at an annual average of €47 – 135 billion. Another analysis concluded that the projected health impacts of air pollution in the EU in 2025 are worth €218 billion to €742 billion per year; about one-fourth of that amount could be avoided by technically feasible reductions in emissions.

While agreeing that there are large benefits of health and environmental regulation, these studies differ widely in coverage and methodology. This report looks more specifically at regulations and regulatory benefits that might be at risk under TTIP. Just two categories, **the benefits of REACH and of renewable**

¹ All facts and references to research and publications in the Executive Summary also appear in the body of the report; see later sections for sources and citations.

energy standards, are worth at least €46 - 110 billion per year, almost equal to the estimated benefits of TTIP. Since many other areas of regulation also have important benefits, the total value of European regulations is far greater than the estimated value of TTIP.

Many TTIP proposals have included an investor-state dispute settlement (ISDS) process, which could enforce downward harmonization and lead to widespread rollbacks of valuable regulations. ISDS mechanisms in existing treaties have allowed private investors to sue for damages attributed to other countries' laws and regulations. Special-purpose tribunals, outside the legal systems of the participating countries, have final authority to assess penalties for policies that are barriers to trade. EU countries, particularly new member states, have been forced to pay substantial sums in ISDS judgments.

1.2. Chemicals policy

The contrast between EU and US regulations may be sharpest in the area of chemicals policy. REACH requires European chemical manufacturers and importers to submit a specified list of information on health and environmental effects of their chemicals; it creates procedures for restricting the use of substances that do not meet safety standards; and it encourages substitution of safer substitutes for harmful chemicals. The US equivalent, the Toxic Substances Control Act (TSCA), only requires companies to supply any information that already exists on their chemicals. TSCA places the burden of proof on the Environmental Protection Agency (EPA), a government agency, to justify any new regulation of hazardous chemicals; the standards of proof are so demanding that EPA has almost never proposed rules limiting production of chemicals.

The US chemical industry has tried for years to change or eliminate REACH. In 2013, the American and European chemical industries developed a joint proposal to use TTIP to weaken chemical regulation, allowing rollback of several aspects of REACH, and preventing the development of stronger regulations by EU member states or states within the US. Meanwhile, hazardous chemicals continue to be widely used in America, and in the world.

Many studies of the benefits of REACH appeared in the debate leading to its adoption in 2007. One assumed that REACH might avoid the costs of cleaning up one major chemical hazard. Another looked at the reduction, due to REACH, in the costs of purifying drinking water and disposing of sediment and sewage sludge. At least three studies estimated the value of a range of health benefits resulting from REACH. The combined total is equivalent, at today's prices, to an annual benefit of €11 - 47 billion.

1.3. Climate and energy regulations

The EU is a world leader in climate policy, with per capita carbon emissions around half as high as the US, although still far above a sustainable level. The Energy Roadmap 2050 calls for nearly complete elimination of greenhouse gases by midcentury, while near-term targets are expressed in a series of other policies and directives. The contrast with US policy is not as stark as in chemicals: American standards are stricter on (non-carbon) air pollution from power plants, and comparable to European standards on vehicle fuel efficiency; many climate and energy policies are set at the state level, with some states such as California approaching European standards, while some others do almost nothing. At the federal level, however, new American policies are constrained by partisan political stalemate.

There are two outstanding accomplishments of European climate and energy regulation: the successful promotion of renewable energy; and the legitimization of an ongoing process of planning and progress toward long-term goals such as climate protection. As of 2013, renewable energy accounted for 25 percent of EU electricity generation; wind and solar energy alone represented 10 percent of electricity.

The comparable US figures were only 13 percent and 4.4 percent, despite the extraordinary wind and solar resources in large parts of the country. Moreover, EU targets for 2020, expressed in the Energy Efficiency Directive, the Renewable Energy Directive, and other measures, will be followed by another set of targets for 2030, which are already under discussion. Progress has slowed since the economic crisis, but the process itself remains in place, creating an important framework for continuing advances.

In 2013, renewable energy in the EU avoided 388 million tonnes of CO₂-equivalent greenhouse gas emissions and 54.3 million tonnes of oil-equivalent of coal combustion, as well as creating 1.25 million jobs. These benefits have a combined annual value of €35 – 63 billion.

1.4. Food and agriculture

Food and agriculture are among the areas with the highest tariff and non-tariff barriers to US-EU trade, in both directions. Studies suggest that full liberalization would benefit the US, causing an increase in agricultural value added in America and a decrease in Europe. The EU has often (not always) taken a precautionary approach to threats to health and the environment, while the US has insisted on cost-benefit analysis as a basis for any new regulations. In the case of pesticides that are known to be harmful to bees, interfering with natural pollination of many crops, the same scientific findings are sufficient to justify preliminary regulation in the EU but not the US.

There are many benefits from European regulation of food and agriculture, including reduced exposure to hazardous pesticides, protection of food safety, improvement of animal welfare, and promotion of goals such as clean water, biodiversity, and other environmental objectives. There are, however, few studies that place monetary values on these benefits. Much of the limited available research has taken place in the US rather than Europe.

Europe has stricter regulation of pesticides, banning at least 82 pesticides that are allowed in America; 9 of these are known carcinogens and 6 others are classified as “extremely hazardous” by the World Health Organization. A study that appears to be the only comprehensive evaluation of pesticide damages estimated that US pesticide use in the early 2000’s imposed health and environmental costs of \$9.6 billion annually. If the same cost per hectare of agricultural land applied to the EU today, it would imply annual damages of €4.3 billion. Some of that is already avoided by existing European regulations, and more could be avoided by future standards.

Food processing regulations are a cause of ongoing conflict between the EU and the US. On precautionary grounds, the EU bans the use of ractopamine in pork, chlorine chemical washes for poultry, and growth-promoting hormones in beef – all of which are permitted in the US. It is difficult to trace direct, quantitative links from such regulations to resulting health benefits, although the value of food safety rules becomes clear in the cases when they fail. Mad cow disease and other livestock disease outbreaks have imposed costs in the billions of euros, leading to hundreds of human deaths and the sacrifice of hundreds of thousands of animals. The latest comprehensive estimate of the cost of foodborne illness in America found an annual cost of \$77.7 billion, equivalent to €212 per capita at today’s prices. Comparably detailed figures are apparently not available for Europe.

European regulations have achieved important successes in animal welfare, including elimination of battery cages for hens, improved space and standards for pigs, a ban on animal testing for cosmetics, and continuous improvement in animal transport conditions. Many studies have estimated that most consumers are willing to pay premiums – for example, price increases of 14 to 34 percent – for meat and eggs from animals raised in humane conditions. An American cost-benefit analysis estimated the value to consumers of a national requirement for cage-free egg production (currently required in only two US

states). If Europeans experience the same average per capita benefits as Americans do from cage-free eggs, then the EU requirement of cage-free conditions for hens has an annual value of €3.7 billion.

1.5. Selected other regulations

Public procurement – spending by public authorities on works, goods and services – amounts to 18 percent of Europe's GDP. EU rules on procurement allow public contracts to reflect environmental, social, and product quality criteria along with price; to include life-cycle costing, incorporating the externalities associated with producing a final product; and to favor tenders that hire the long-term unemployed or other disadvantaged groups.

Procurement rules have been described as obstacles to EU-US trade, in both directions; US construction companies have identified public procurement standards as the most important non-tariff barrier to their expansion in Europe. The standards employed in many trade treaties could imply that procurement should be based on lowest cost alone, rejecting the broader purposes of EU procurement rules.

Data services and privacy are another area in which Europe and America have adopted opposite approaches. The European Directive on Data Protection prevents dissemination of data on an individual unless the individual has given unambiguous, specific consent; it also prohibits manipulative, secret collection of personal data. A revision of the directive, currently under discussion, would establish the "right to be forgotten" (the right to delete obsolete and unwanted data), application of EU rules to all companies that sell products or collect data in Europe, and other measures.

In the US, on-line merchants and other organizations can often make decisions about future use of personal data, which individuals are powerless to prevent. Under the Safe Harbor Framework, US businesses can certify their own compliance with standards equivalent to EU rules, in order to allow them to conduct on-line transactions in Europe. This framework has become controversial, and will need to be revised to correspond to the revised directive on data protection. The Snowden revelations have demonstrated that there are national security as well as commercial issues at stake in the protection of data services and on-line privacy.

Labor rights and social welfare also reveal deep differences between European and American regulations, in the areas of labor rights, the role of unions, social services, and public welfare. For example, in the area of working time regulation, the EU limits all workers to an average of 48 hours per week, including any overtime, and requires a paid annual leave of at least 4 weeks. The US has no comparable standards; it requires that non-professional employees receive a 50 percent wage premium for work in excess of 40 hours per week, but sets no maximum hours of work or minimum paid annual leave. US regulations are closer to, though still weaker than, EU standards for parental leave for childbirth or adoption.

Finally, in an area of detailed, specific regulation in both systems, the EU limits truck drivers to 9 hours of driving per day, 56 hours per week, and 90 hours per fortnight. The corresponding US limits are 11 hours of driving per day and 70 hours every 8 days. The government agency that developed the US standards wanted to propose less than 11 hours per day, but found that cost-benefit analysis did not support that proposal – even though crashes involving trucks kill nearly 4,000 people per year, and the annual cost of truck and bus crashes in America has been estimated at \$99 billion. The US Congress is currently proposing to allow an even weaker standard, 82 hours of truck driving per week.

1.6. The gains from TTIP: Positive or negative?

The many dimensions of regulatory benefits are invisible in most studies of the economic impacts of TTIP. Regulations are seen merely as non-tariff barriers to trade, which have to be rolled back to achieve the estimated income gains from liberalization. Such estimates, however, are based on global trade models, almost all of which rely on the assumption of permanent full employment: workers displaced from one sector by TTIP will always find work in another. This assumption renders the models unable to analyze job gains or losses. Full employment is an input to such models, not an output.

One major assessment of TTIP, by Jeronim Capaldo, uses a United Nations model, which allows future policies to result in changes in employment. He finds that TTIP would lead to a gain of 784,000 jobs in the US and a loss of 583,000 jobs in the EU. A critique of Capaldo's work insists that he uses methods that virtually all economists would reject. Capaldo's response is that policymakers have to decide whether it is more reasonable to assume permanent full employment, implying gains from TTIP, or to assume that employment can vary and the economy is driven by demand, implying losses from TTIP.

TTIP would put many of the benefits of European regulation at risk: protection of human health and the natural environment, maintenance of social and labor standards, creation of strong and sustainable communities, stabilization of the earth's climate. Why risk losing these greater goods in the pursuit of small and uncertain income gains projected by some but not all economic models?

2. TRADE LIBERALIZATION TODAY

The European Union and the United States are negotiating a proposed treaty to liberalize trade, the Transatlantic Trade and Investment Partnership (TTIP). Supporters of the treaty suggest that it will result in big economic gains on both sides of the Atlantic. According to a study of TTIP by the Centre for Economic Policy Research (CEPR),

Under a comprehensive agreement, GDP is estimated to increase by between 68.2 and 119.2 billion euros for the EU and between 49.5 and 94.9 billion euros for the US.²

Another study, from CEPII, provides a similar estimate, projecting that TTIP will bring annual gains of \$98 billion to the EU and \$64 billion to the US. CEPII's projected benefit for the EU is equivalent to 84 billion euros per year at today's prices.³

Viewed in isolation, these numbers might sound large. Yet they are actually small when seen in perspective, from at least two points of view.⁴ The projected gains from TTIP are smaller than the benefits of European regulations that might be at risk under the treaty, as this report will demonstrate. And the projected gains from TTIP are smaller than past estimates of the value of trade liberalization.

Projections of large benefits from trade liberalization have been heard for many years. But the remaining opportunities are growing smaller, because there is so little protectionism left in the world economy. In the 1990s and earlier, there were substantial tariffs and quotas that limited international trade. Since that time, negotiations have led to far-reaching reductions in tariffs and trade barriers, including important measures such as China's entry into the World Trade Organization in 2001, and the end of textile quotas under the Multi Fibre Agreement, which expired in 2004. The expansion of the EU from 12 members in the early 1990s to 28 today has liberalized and expanded trade within Europe. Even by 2005, detailed estimates of the remaining global gains from trade liberalization were much smaller than in earlier years.⁵

Paul Krugman, who received a Nobel Prize in economics for his work on trade theory, recognizes past benefits from liberalization, but now says that "Trade restrictions just aren't a major drag on the world economy these days, so the gains from liberalization must be small."⁶ Cutting the tiny remaining barriers to trade, according to Krugman, "isn't going to give you a boost that you'll be able to tell from statistical noise."⁷

Average tariffs on EU-US trade are now less than 3 percent, too small to have much effect on either Europe or America.⁸ Projections of large economic benefits from TTIP are based almost entirely on a new category of policy changes: the removal of non-tariff barriers to trade. According to CEPR,

Reducing non-tariff barriers will be a key part of transatlantic liberalisation. As much as 80% of the total potential gains come from cutting costs imposed by bureaucracy and regulations,

2 Centre for Economic Policy Research (2013), "Reducing Transatlantic Barriers to Trade and Investment: An Economic Assessment," 2.

3 CEPII (2013), "Transatlantic Trade: Whither Partnership, Which Economic Consequences?" CEPII's estimates are in 2007 dollars, which were converted to 2014 dollars, then converted to euros at €1.00 = \$1.33.

4 See also the critique of the CEPR study, from the similarly named but unrelated American organization, Center for Economic Policy Research, at <http://www.cepr.net/documents/TTIP-brief-08-2015.pdf>.

5 Frank Ackerman and Kevin P. Gallagher (2008), "The Shrinking Gains from Global Trade Liberalization in Computable General Equilibrium Models: A Critical Assessment, International Journal of Political Economy, 50-77.

6 Krugman (2015), "TPP at the NABE", <http://krugman.blogs.nytimes.com/2015/03/11/tpp-at-the-nabe/>.

7 Krugman (2015a), "Suspicious Nonsense on Trade Agreements", <http://krugman.blogs.nytimes.com/2015/01/19/suspicious-nonsense-on-trade-agreements/>.

8 See <http://ec.europa.eu/trade/policy/countries-and-regions/countries/united-states/>.

as well as from liberalising trade in services and public procurement.⁹

TTIP, in other words, is viewed by its supporters primarily as a means to remove bureaucratic and regulatory barriers. This would harmonize standards in the US and EU, promoting efficiency and expanding mutual opportunities for trade.

Harmonization of standards could have several different meanings. It is possible to harmonize upward, adopting the stricter of US and EU standards – or downward, adopting the weaker of the two. The European Commission has repeatedly stated that it will not accept downward harmonization, but this may not be enough to eliminate the risk that TTIP will generally weaken standards. European negotiating positions have asserted the right of each side to regulate to the level it finds appropriate, but even if this principle is adopted, it could still give recognition to both sides' regulations as equally legitimate. If the weaker side's regulations appeared to lower costs or ease impacts on affected enterprises, these short-run considerations could obscure the long-term benefits of regulation – leading to political demands for downward harmonization.

An even vaguer formulation, "regulatory cooperation", has been widely used in discussion of TTIP. This concept, which first appeared in the 1990s, means, in practice, that businesses from both sides should be given ample opportunities to intervene in, comment on and lobby about both sides' regulations, from the initial drafting stages through evaluation and adoption.¹⁰ Early stages of regulatory cooperation have already muted European regulations on hazardous substances, among others; the US Chamber of Commerce has described regulatory cooperation as "a gift that keeps on giving".¹¹ EU proposals for TTIP would institutionalize a higher level of regulatory cooperation for the future, creating a mechanism to narrow the gap between European and American regulations. Again, downward harmonization is the most likely long-term outcome.

Moreover, many TTIP proposals have included a mechanism, the investor-state dispute settlement (ISDS) process, which often enforces downward harmonization. ISDS clauses, included in many recent trade agreements, have allowed private investors to sue national governments in an attempt to change laws and regulations. Section 4 looks at the effects of ISDS on Europe under existing trade agreements, and at a variant on ISDS in recent EU proposals for TTIP.

If, through these or other mechanisms, TTIP led to downward harmonization of regulations, adopting the weaker of EU and US regulations in each area, what would be lost? Existing regulations are not, in general, arbitrary bureaucratic impediments to business; rather, they are designed to protect human health, sustainable communities, and the natural environment. The two sides of the Atlantic differ widely on chemicals policy, climate and energy policy, agriculture and food safety, public procurement, data protection and privacy, and labor and social rights. In each of these areas there are vital benefits of EU regulations and policies that could be at risk under TTIP, as this report demonstrates.

⁹ CEPR (2013), vii.

¹⁰ Corporate Europe Observatory (2016), "Dangerous Regulatory Duet: How transatlantic regulatory cooperation under TTIP will allow bureaucrats and big business to attack the public interest", http://corporateeurope.org/sites/default/files/attachments/regulatoryduet_en021.pdf.

¹¹ Ibid., 7.

3. COSTS AND BENEFITS OF REGULATIONS

3.1. The value of health and environmental protection

The multi-year process of US-EU negotiation, the extensive publicity and the passion (pro and con) surrounding TTIP all suggest that the stakes are high. There is no official blueprint for regulatory changes under TTIP, and US negotiating positions and proposals have not been made public. In multiple areas, however, European and American standards are widely different. In the words of a study for the European Parliament,¹²

Overall, a pattern is apparent wherein the US have chosen to either not acknowledge risks to the environment and human health recognised by the EU, or to address such risks in ways which markedly differ from the approach chosen in Europe, for instance by merely promulgating voluntary guidelines rather than mandatory requirements.

At the dawn of the modern era of environmental protection, in the 1970s and early 1980s, America was ahead of Europe, and the world, in setting environmental standards. Yet as David Vogel has shown, Europe moved ahead and America fell behind in the 1990s, a pattern that continues today.¹³ Since the 1990s, EU standards often, though not always, have provided greater protection of human health, sustainable communities, and the natural environment. (Jonathan Wiener has offered a different view, suggesting that America and Europe are similarly precautionary.¹⁴ Much of the disagreement stems from different choices of case studies; for example, Wiener considers American initiatives in regulation of tobacco, nuclear power, and terrorism.¹⁵ The areas of regulation examined in this report lend support to Vogel's interpretation.)

Today, EU standards are formalized in the *acquis* – the body of laws and standards that EU member states agree to uphold. The environmental *acquis*, one of 35 chapters of the *acquis*, includes more than 200 major legal acts. It

...aims to promote sustainable development and protect the environment for present and future generations. It is based on preventive action, the polluter pays principle, fighting environmental damage at source, shared responsibility and the integration of environmental protection into other EU policies.¹⁶

A 2011 study for DG Environment assessed the costs of incomplete implementation of the environmental *acquis*.¹⁷ The study estimated that in six areas of regulation – waste, biodiversity and nature, water quality, air quality, chemicals policy, and noise – the costs of not yet meeting the standards for 2020 amounted to €200 – 300 billion per year. The costs of failure to meet standards already in effect in 2011 was estimated at €50 billion per year. These costs of incomplete implementation of standards – or equivalently, the benefits of future, higher levels of implementation – included the value of materials and energy that could have been recovered from landfilled waste, public willingness to pay for cleaner

¹² Christiane Gerstetter et al. (2013), "Legal implications of TTIP for the *acquis communautaire* in ENVI relevant sectors", DG Internal Policies, Policy Department A: Economic and Scientific Policy; quote from p.21.

¹³ Christiane Gerstetter et al. (2013), "Legal implications of TTIP for the *acquis communautaire* in ENVI relevant sectors", DG Internal Policies, Policy Department A: Economic and Scientific Policy; quote from p.21.

¹⁴ Jonathan B. Wiener, Michael D. Rogers, James K. Hamitt, and Peter H. Sand, eds. (2011), *The Reality of Precaution: Comparing Risk Regulation in the United States and Europe*. Washington DC: RFF Press/Earthscan.

¹⁵ Wiener contrasts his work with Vogel's in Jonathan B. Wiener (2013), "The politics of precaution, and the reality", *Regulation and Governance* 7: 258–265.

¹⁶ http://ec.europa.eu/enlargement/policy/conditions-membership/chapters-of-the-acquis/index_en.htm.

¹⁷ COWI, Ecorys and Cambridge Econometrics (2011), "The costs of not implementing the environmental *acquis*".

water, and the health benefits of reduced exposure to air pollution, toxic chemicals, and excessive noise.

Despite the progress that has been made in environmental protection, there is much more that remains to be done. A cost-benefit analysis of the Clean Air Policy Package concluded that under current legislation, the projected health impacts of air pollution in the EU in 2025 are worth €218 billion to €742 billion per year; about one-fourth of that amount could be avoided by a scenario of maximum technically feasible reduction in emissions.¹⁸

Removal of non-tariff barriers to trade under TTIP could imply downward harmonization, reducing many European regulations to American levels. While proponents of TTIP project that it could be worth €68 - 119 billion per year to Europe, as seen in Section 2, the available studies of the benefits of regulation demonstrate that existing or potential future regulations could be worth even more.

Are regulatory costs in general so high that there would be a great economic boost from reducing them? A recent report looks at six areas of European and international regulation, including REACH, the Montreal Protocol for protecting the ozone layer, and EU regulation of air pollution and of pesticides, concluding that claims of high and unwarranted costs consist of "crying wolf."¹⁹ Research has also shown that the economic burdens of regulation are routinely exaggerated in American political debate.²⁰ An in-depth review of studies of the employment impacts of American regulations concluded that the net effects are close to zero: rigorous economic research does not support either fears of "job-killing regulations" or hopes for large numbers of "green jobs" resulting from environmental regulations.²¹

Box: How important are technical standards?

Defenders of TTIP often cite cases of technical differences between European and American regulations, as evidence of the need for harmonization. Some obstacles to trade have been caused by differences in technical specifications for the same product or process. Some standards for automobile design and testing, for electrical wiring, even for performing the same food safety tests are needlessly different on the two sides of the Atlantic, adding to the expense of trade without providing any real benefit to either economy.

On a grander scale, global trade would be simplified and manufacturing could be more completely and efficiently standardized if the United States joined the world in adopting the metric system. This goal seems stubbornly unattainable, and TTIP is not expected to change the metric status quo. (One of the least prominent candidates for the American presidency in 2016, Lincoln Chafee, advocated conversion to the metric system.)

Could mere removal of technical differences in standards lead to the large projected benefits from TTIP? And is a major treaty needed to remove these barriers? Aside from the impossible dream of a metric America, many differences in technical specifications could be resolved by industry-level negotiations, since both sides would benefit from standardization.

18 EMRC (2014), "Cost-benefit analysis of final policy scenarios for the EU Clean Air Package." Values are in 2005 euros. The range of values reflects differing hypotheses about valuation of mortality.

19 Chemsec (2015), "Cry Wolf: Predicted costs by industry in the face of new environmental regulations."

20 Frank Ackerman (2006), "The Unbearable Lightness of Regulatory Costs," Fordham Urban Law Journal, 1071-1096; Lisa Heinzerling and Frank Ackerman (2012), "The \$1.75 Trillion Lie," Michigan Journal of Environmental and Administrative Law, 127-158; Lisa Heinzerling (1998), "Regulatory Costs of Mythic Proportions," Yale Law Journal, 1981-2070.

21 Cary Coglianese, Adam M. Finkel and Christopher Carrigan, editors (2014), *Does Regulation Kill Jobs?* (Philadelphia: University of Pennsylvania Press).

3.2. Pricing the benefits of regulation

What are European regulations worth today? If a new trade treaty led to Europe adopting American standards, what would be lost? The answers cannot be entirely expressed in monetary terms, since some benefits do not have meaningful prices.

Any accounting of the benefits of regulation must include the value of protecting human health and our natural surroundings. This is not a new idea: for nearly a century, dating back to the work of Arthur Pigou²², economic theory has recognized the need to price externalities (the unintended, non-market impacts of economic activity on third parties), and to incorporate externality values into measures of well-being. Methods of valuation are discussed in many standard sources, including a 2013 study for the European Commission,²³ as well as comparable American sources.

In practice, however, two problems limit the valuation of externalities, from opposite sides. On the one hand, the methods used to monetize health and nature may demean and diminish those values. Ethical issues are often involved, and the benefits of greatest importance are literally “priceless.”²⁴ As Immanuel Kant observed long ago, some things have a price, while others have a dignity.

On the other hand, the rise of anti-environmental politics in recent years, particularly in the United States,²⁵ has challenged the valuation of many externalities, and has raised obstacles to the acceptance of new estimates of health and environmental costs. A handful of monetary values for major health and environmental impacts are generally accepted, frequently based on semi-standardized values for mortality and morbidity. Many other, less studied impacts, including many ecological impacts that do not directly affect human health, do not have established valuations, and are therefore ignored by default in cost-benefit calculations.

Even when there is agreement on the costs of health and environmental impacts, there are additional challenges to interpretation of these values. Cost-benefit analysis typically compares costs and benefits to society as a whole, even though the costs and benefits of the same policy are often experienced by different groups. Air pollution regulations may impose costs of emission control devices on factories and power plants, while improving the health of nearby communities. Conversely, easing the economic “burden” of such regulations, by weakening air pollution standards, may lower costs for factories and power plants, while harming the health of their neighbors. Some regulations are needed to achieve minimum acceptable standards of health for certain communities, even if costs are imposed on others.

Precautionary regulations are often designed to avoid or mitigate rare, catastrophic events. The value of regulation in this case depends on both the frequency and the magnitude of avoided or controlled catastrophes. One of the studies discussed in Section 5 found that if REACH avoids one major toxic chemical cleanup, the benefits of reduced cleanup costs will exceed the total costs of compliance with REACH.²⁶ The value of climate policies, in Section 6, depends on the climate damages that might be avoided by reducing emissions. The worst climate damages often involve rare, extreme events, such as the disastrous heat waves of 2003 in Western Europe and 2010 in Russia and Eastern Europe. The

22 Arthur Pigou (1920), *The Economics of Welfare* (London: Macmillan and Co.).

23 European Commission (2013), “Assessing the costs and benefits of regulation,” http://ec.europa.eu/smart-regulation/impact/commission_guidelines/docs/131210_cba_study_sg_final.pdf.

24 Frank Ackerman and Lisa Heinzerling (2004), *Priceless: On Knowing the Price of Everything and the Value of Nothing* (New York: The New Press).

25 Judith A. Layzer (2012), *Open for Business: Conservatives’ Opposition to Environmental Regulation* (Cambridge, MA: MIT Press).

26 TemaNord (2004), “Cost of Late Action – the Case of PCB,” Nordic Council of Ministers, http://www.oecd-ilibrary.org/environment/cost-of-late-action-the-case-of-pcb_tn2004-556.

value of food safety rules, a topic of Section 7, depends in part on how many tragic and costly outbreaks such as mad cow disease (BSE) will be avoided by regulations.

How many toxic chemical exposures, extreme weather events, and foodborne disease epidemics can be avoided or controlled by precautionary policies? How much should be done to address catastrophic risk? It would, in theory, be possible to spend too much on overly precautionary regulation. In practice, excessive precaution is rare but the opposite error is common: studies by the European Environment Agency (EEA) have shown that again and again, society has waited too long to take action on credible warnings of serious health and environmental risks, incurring much greater human, ecological, and economic costs as a result of delays.²⁷

Faced with these dilemmas, this report cites monetary valuations of benefits where possible, but also describes impacts of regulations in non-monetary terms such as lives saved, risks reduced, or diseases averted. The result is a multi-dimensional picture of the benefits of European regulations, only some of which can be expressed in terms of money.

3.3. A partial accounting

Research on the value of regulations potentially at risk under TTIP, described in later sections of this report, finds two major areas where it is possible to estimate benefits in monetary terms: REACH, and renewable energy. As explained in Section 5, multiple studies have assigned monetary values to health and environmental aspects of the benefits of REACH. As explained in Section 6, there are climate, health, and employment benefits from the EU success in promotion of renewable energy.

Category	(billions of euros)
Benefits of REACH <i>(see Table 5-1)</i>	10.8 – 47.0
Benefits of renewable energy <i>(see Table 6-2)</i>	35.5 – 62.8
TOTAL	46.3 – 109.8

Table 3-1. Annual benefits of REACH and EU renewable energy policies

Table 3-1 shows that the annual benefits in these two areas alone are almost equal to the claimed annual benefits of TTIP. And there are many additional benefits of regulation, with annual values in the billions of euros. A US cost-benefit analysis of a ban on battery cages for chickens, described in Section 7, would, if extrapolated to the EU, imply an annual benefit of almost €4 billion. As discussed in Section 8, a loss of even one percent of the employment generated by public procurement could be worth €2-3 billion per year. These and other benefits make it clear that the total value of EU regulations greatly exceeds the claimed benefits of TTIP. And as shown in Section 9, questions have been raised about the validity of the estimated gains from TTIP.

²⁷ See the two "late lessons" studies: EEA (2013), "Late lessons from early warnings: Science, precaution, innovation"; and EEA (2002), "Late lessons from early warnings: The precautionary principle 1896-2000". There are almost no real cases of excessively precautionary regulation, as shown by Steffen Foss Hansen and Joel A. Tickner, "The precautionary principle and false alarms - lessons learned", in EEA (2013).

4. INVESTOR-STATE DISPUTE SETTLEMENT

4.1. ISDS in practice

Since tariffs are already very low, the TTIP discussion has focused on removing non-tariff barriers to trade. These “barriers” often consist of regulations that were designed to protect health and safety, the natural environment, and social and economic well-being.

Most of the proposals for TTIP have included an investor-state dispute settlement (ISDS) mechanism, similar to those in several recent trade agreements. The proposed Comprehensive Economic and Trade Agreement between the EU and Canada includes an ISDS process, as do many existing bilateral and regional trade agreements.

Although the details differ among agreements, ISDS mechanisms allow private investors to sue for damages that they attribute to other countries’ laws, regulations and administrative decisions. A special-purpose tribunal, outside the legal and political systems of the participating countries, has final authority to assess monetary penalties based on national or subnational policies that are considered barriers to trade. Such penalties typically force governments to reverse the policies in question.

A total of 127 ISDS cases had been filed against EU countries through 2014, most of them against new member states in Eastern Europe.²⁸ Most of the cases against EU countries have been brought by investors or firms based in other European countries.²⁹ Of the 63 cases in which outcomes were known in 2014 (many were still unresolved), 28 resulted in judgments in favor of investors, or negotiated settlements. A judgment against Romania penalized the country for following EU laws, raising questions about ISDS and EU sovereignty. The case arose when Romania altered or withdrew investment incentives that had formerly been offered to a group of Swedish investors, in order to comply with legal requirements for accession to the EU. The European Commission intervened on behalf of Romania, but the ISDS tribunal still ordered Romania to pay the investors \$250 million (€183 million).

More than half of the ISDS cases filed against EU countries have involved environmental concerns. The Swedish power company Vattenfall has demanded compensation from Germany twice, for the regulation of a German coal plant, and for the decommissioning of two German nuclear power plants after Fukushima. The first case resulted in a negotiated weakening of water pollution standards for the coal plant; the second is still pending.

The United Nations Conference on Trade and Development puts the worldwide total of known ISDS cases through 2014 at 608, with a rising trend over time.³⁰ Of the 356 cases that had concluded, 25 percent awarded monetary compensation to the investor, and another 28 percent reached a negotiated settlement, often with confidential terms. Most of the investors who initiate ISDS cases are based in the United States, Canada, and Europe. The countries most often challenged in ISDS cases are Argentina, Venezuela, the Czech Republic, and Egypt, although 100 countries have faced at least one case.

Defenders of ISDS have argued that it is necessary in order to facilitate international trade and to attract foreign investment. But several countries have rejected ISDS without being excluded from trade and investment. South Africa and Indonesia have announced that they will not accept any new ISDS

28 Friends of the Earth Europe (2014), “The hidden cost of EU trade deals: Investor-state dispute settlement cases taken against EU member states”.

29 Cecilia Olivet (2013), “A test for European solidarity: The case of intra-EU Bilateral Investment Treaties”, Transnational Institute.

30 UNCTAD (2015), “Recent Trends in IIAs [international investment agreements] and ISDS,” http://unctad.org/en/PublicationsLibrary/webdiaepcb2015d1_en.pdf.

agreements. Brazil has never signed a treaty that includes ISDS provisions.³¹ These countries remain important trading partners for the US and Europe, and continue to receive foreign investment despite rejecting ISDS. If emerging economies such as South Africa, Indonesia and Brazil do not need ISDS to ensure access to international trade and investment, there is certainly no reason to think that Europe or the United States needs it.

4.2. The new EU proposal

Responding to widespread opposition to ISDS, the EU introduced a new proposal in 2015, replacing ISDS with a new Investment Court System (ICS). The ICS would establish permanent tribunals, rather than the ad hoc panels assembled for each case under many ISDS agreements; there would be improved transparency, a right of appeal to a new appeals court, and shorter timelines for decisions.

Success of the ICS proposal, however, is far from guaranteed, as it has come under attack both for doing too much and too little. On the one hand, US negotiators and some business lobbies have been cool to the proposal, claiming that it tilts too far toward states and investors. As of early 2016, news reports suggested that the EU faces a “tough sell” on the ICS.³²

On the other hand, NGOs opposed to ISDS have claimed that ICS is a mere rebranding; if ISDS has died, some have described ICS as a “zombie ISDS”.³³ A detailed analysis of the ICS proposal by a legal scholar finds that it is still flawed, with language that enables the same kind of abuses seen under ISDS.³⁴

31 The Economist (2014), “The arbitration game,” October 11.

32 Hans von der Burchard (2016), “EU faces tough sell on TTIP compromise”, Politico, February 7, <http://www.politico.eu/article/eu-faces-tough-sell-on-ttip-compromise-malmstroem-froman/>.

33 Corporate Europe Observatory (2016), “The zombie ISDS: Rebranded as ICS, rights for corporations to sue states refuse to die”, <http://corporateeurope.org/international-trade/2016/02/zombie-isds>.

34 Gus van Harten (2015), “Key flaws in the European Commission’s proposals for foreign investor protection in TTIP”, <http://ssrn.com/abstract=2692122>.

5. CHEMICALS POLICY

5.1. Two styles of regulation

The contrast between EU and US approaches to regulation may be sharpest in the area of chemicals policy. REACH, adopted in 2007, requires manufacturers and importers of chemicals sold in Europe to submit information on selected effects of their chemicals on health and the environment to the European Chemicals Agency. If the required data are missing, the registrants have to perform the necessary tests. REACH also creates procedures for restricting the use of substances that do not meet specified safety standards, and encourages substitution of safer alternatives for harmful chemicals.

The US equivalent is the Toxic Substances Control Act (TSCA), adopted in 1976. Under TSCA, the Environmental Protection Agency (EPA) is responsible for determining whether chemicals are hazardous. To take action against a hazardous chemical under TSCA, EPA must meet very demanding standards of proof – so demanding that the law has almost never been used.

A comparison of REACH and TSCA prepared by the US Government Accountability Office (GAO) identifies several major differences.³⁵

- REACH requires companies to provide information on all chemicals with European sales of at least one tonne per year, including a requirement to develop the information if data are missing. TSCA only requires companies that begin selling new chemicals in America to provide any information that already exists. New information does not have to be developed unless EPA formally adopts a rule governing a specific chemical. In practice, this is so difficult that EPA rarely adopts such rules; instead, EPA has voluntary programs to collect any information that companies are willing to provide.
- REACH provides a straightforward process for national and European agencies to identify substances of very high concern (for instance, carcinogens or toxic chemicals that accumulate in the environment). As of June 2015, this process had identified 31 substances requiring authorization under REACH. Companies seeking authorization to use these substances have to demonstrate that the risks are adequately controlled or that socio-economic benefits outweigh the risks and no suitable alternative is available. TSCA, in contrast, places the burden of proof entirely on EPA to demonstrate that a chemical poses risks before it can be regulated. When proposing regulations, EPA must also demonstrate that it has chosen the least burdensome method of mitigating risk.
- Both REACH and TSCA allow companies to protect confidential business information, but REACH requires greater public disclosure; TSCA allows companies to make much broader claims of confidentiality.

As a result of the limits placed on government action by TSCA, EPA has developed rules limiting production of only five existing chemicals: polychlorinated biphenyls (PCBs), fully halogenated chlorofluoroalkanes, dioxin, asbestos, and hexavalent chromium. Although EPA spent 10 years developing its asbestos rule, US courts overturned the rule when it was challenged by industry, on the grounds that EPA had not presented enough evidence to justify a ban on this well-known, extremely toxic substance. EPA also requires companies to provide 90 days advance notice before beginning

³⁵ US Government Accountability Office (2007), "Chemical Regulation: Comparison of US and Recently Enacted European Union Approaches to Protect against the Risks of Toxic Chemicals," GAO-07-825.

production or new uses of any of a list of 160 chemicals – but again, the burden of proof is on EPA to demonstrate that production or new uses of these chemicals would pose an unreasonable risk.

If the US chemical industry had only two choices, complying with REACH or losing access to European markets, the answer would be clear: loss of all US chemical exports to the EU would be roughly 1,000 times more costly than the modest burdens imposed on US exporters by REACH.³⁶ A third choice for the industry, however, is trying to weaken or eliminate REACH. The US Trade Representative's annual report on Technical Barriers to Trade (TBT) always contains a litany of complaints about REACH. The latest version observes that "concerns regarding REACH have been raised at every WTO (World Trade Organization) TBT Committee meeting since 2003 by the United States and many other delegations..."³⁷

In 2013, the American and European chemical industries developed a joint proposal to use TTIP to weaken chemical regulation, creating an industry-sponsored body to review regulations, along with new requirements for cost-benefit analyses, joint methods for risk assessment, evaluation and prioritization of hazards, and more. The proposal, leaked from the TTIP negotiations, provided the industry with several opportunities to roll back important aspects of REACH, and could prevent EU member states or states within the United States from developing their own, stronger regulations.³⁸

Meanwhile, hazardous chemicals remain a serious threat to health and environment. In the US, 81 chemicals that are known to be hazardous are produced or imported annually in quantities of at least 454 tonnes (1 million pounds); 14 exceed 454,000 tonnes (1 billion pounds) per year, including formaldehyde and benzene, known to be carcinogens, and bisphenol A, an endocrine disruptor.³⁹

REACH provides a framework for addressing chemical hazards, but has not eliminated all such threats. An international team of prominent scientists has recently estimated the burden of disease costs attributable to endocrine-disrupting chemicals in the EU; their median estimate is €157 billion per year, more than one percent of EU gross domestic product.⁴⁰ Another study found that roughly 65,000 people in Europe die every year from the effects of carcinogens at work, more than twice the number of deaths from car accidents. Evidence from the UK suggests that almost all work-related cancer deaths are caused by just 10 chemicals, raising the possibility of a sharp reduction in occupational cancer deaths if a few deadly substances can be controlled.⁴¹

The costs of toxic chemical exposure are of global importance, a dimension that should not be ignored by chemical-exporting regions such as the EU and the US. A United Nations study estimates that a selected list of toxic chemicals results in a worldwide total of almost one million deaths per year, comparable to malaria and equal to 1.6 percent of total deaths from all causes.⁴²

36 Frank Ackerman, Elizabeth A. Stanton and Rachel Massey (2007), "European Chemicals Policy and the United States: The Impacts of REACH," Renewable Resource Journal, available at http://frankackerman.com/publications/costbenefit/European_Chemical_Policy.pdf.

37 US Trade Representative (2014), "2014 Report on Technical Barriers to Trade," p.70, available at <https://ustr.gov/sites/default/files/2014%20TBT%20Report.pdf>.

38 Center for International Environmental Law and ClientEarth (2014), "Toxic partnership: A critique of the ACC-CEFIC proposal for trans-Atlantic cooperation on chemicals."

39 Environmental Defense Fund (2014), "Toxics Across America: Who Makes the Billions of Pounds of Toxic Chemicals Flowing Through the US Economy Each Year."

40 Leonardo Trasande et al. (2015), "Estimating Burden and Disease Costs of Exposure to Endocrine-Disrupting Chemicals in the European Union," Journal of Clinical Endocrinology and Metabolism 100, 1245-1255, <http://press.endocrine.org/doi/10.1210/jc.2014-4324>.

41 As described in Martin Myant and Ronan O'Brien (2015), "The TTIP's Impact: Bringing in the Missing Issue," European Trade Union Institute Working Paper 2015.01.

42 United Nations Environment Programme (2013), "Costs of Inaction on the Sound Management of Chemicals," http://www.unep.org/chemicalsandwaste/Portals/9/Mainstreaming/CostOfInaction/Report_Cost_of_Inaction_Feb2013.pdf.

5.2. Costs of REACH

The debates leading up to the adoption of REACH in 2007 produced multiple analyses of the costs of REACH. The total costs to industry, primarily for testing and registration of chemicals, amounted to a few billion euros (estimates ranged from €2 billion to €7 billion, depending on a variety of technical assumptions). While this may look like a large expense on its own, it is a very small change in costs for a very large industry. REACH was always designed to take effect gradually, so the costs should be compared to the revenues of the European chemical industry over the phase-in period. One study, using a cost estimate of €3.5 billion, found that over an 11-year phase-in period the costs of REACH amounted to only 0.0006 (1/16 of one percent) of projected chemical industry revenues.⁴³

More recent discussion has focused on costs of REACH to small and medium enterprises (SMEs), and impacts on innovation in the chemical industry. This has provided a more nuanced understanding of chemicals policy and led to minor revisions in regulations, but has not changed the underlying rationale or the projected accomplishments and benefits of REACH.

Like any protective regulation, REACH inevitably poses larger proportional burdens on SMEs that use small volumes of multiple chemicals. One recent assessment estimated that the costs of compliance⁴⁴ with REACH for SMEs are twice as large as predicted in advance. It recommended a number of technical changes, both in SME business practices and in REACH implementation, to reduce the burdens of compliance. An in-depth study of Dutch SMEs found that relatively few were affected by REACH, and recommended improvements in collection and dissemination of information, and in details of REACH implementation, to reduce burdens on the most affected SMEs.⁴⁵ Responding to such concerns, the European Chemicals Agency has reduced the fees for REACH compliance for SMEs.⁴⁶

On the other hand, there are already signs that stringent regulation is having the intended effects. A study by the Center for International Environmental Law found that stronger laws have led to greater innovation in safer chemical alternatives: the adoption of REACH was followed by an upsurge in patents for safer alternatives to phthalates, a category of industrial chemicals that are endocrine disruptors.⁴⁷

5.3. Benefits of REACH

The benefits of REACH consist of preventing exposure to toxic chemicals, thereby avoiding health and environmental damages and reducing costs of sanitation and disposal. At least five studies have estimated the monetary value of some of the benefits of REACH. The results, expressed as annual benefits at current prices, are summarized in Table 5.1, below.

One study estimated the cumulative costs of cleaning up one major chemical hazard, assuming that it will be half as expensive as the cleanup of PCBs, and will take 24 years. The result was a present value of €7 – 27 billion at 2003 prices.⁴⁸ Converted to annual costs at current prices (see box, next page),

43 Frank Ackerman and Rachel Massey (2004), "The True Costs of REACH," Nordic Council of Ministers, http://frankackerman.com/publications/costbenefit/True_Costs_REACH.pdf.

44 Ineke Gubbels, Jacques Pelkmans and Lorna Schrefler (2013), "REACH: A killer whale for SMEs?", <http://www.ceps.eu/publications/reach-killer-whale-smes>

45 J.J. Boog, F.A. van Broekhuizen, H.B. Krop, and C. Veldhuis-Van Essen (2013), "Impact REACH op het MKB," <http://www.panteia.nl/Nieuwsoverzicht-IPM/~/media/7%20Panteia/Files/rapport-impact-reach-op-mkb.ashx>

46 http://echa.europa.eu/view-article/-/journal_content/title/verification-of-fee-reductions-echas-management-board-adjusts-administrative-charge-levels

47 Baskut Tuncak (2013), "Driving innovation: How stronger laws help bring safer chemicals to market," Center for International Environmental Law.

48 TemaNord (2004), "Cost of Late Action – the Case of PCB," Nordic Council of Ministers, http://www.oecd-ilibrary.org/environment/cost-of-late-action-the-case-of-pcb_tn2004-556.

the cost of cleaning up one major chemical hazard would be €0.5 – 1.7 billion per year.

A study commissioned by DG Environment offered several calculations of benefits of REACH.⁴⁹ In the calculation the authors considered most robust, REACH was found to reduce the costs of drinking water purification and disposal of dredging sediment and sewage sludge by €2.8 – 9.0 billion per year, at 2005 prices. Converted to current prices, this is €3.4 – 10.9 billion per year. Other calculations in the report, estimating the public willingness to pay for clean drinking water or the avoidance of severe health impacts, yielded much larger estimates, in the tens of billions of euros.

Box: The annual value of cumulative benefits

The estimated benefits of TTIP, as seen in Section 2, and other regulatory benefit estimates discussed in this report, are usually expressed in terms of annual amounts. However, four of the five studies included in Table 5.1 report the cumulative, multi-year present value of selected benefits of REACH, which are not directly comparable to annual benefits.

To convert cumulative present values into equivalent annual benefits, each study is assumed to have a constant level of real annual benefits over the time period of its analysis.⁵⁰ The level of annual benefits is calculated to match the reported cumulative present value, at the study's discount rate.

Values expressed at earlier years' prices have been updated to 2014 euros using the Harmonised Index of Consumer Prices (HICP) for the EU-28. Throughout this report, "current prices" refers to 2014 euros. Note that at current, near-zero levels of inflation, there is very little difference between data expressed in 2013, 2014, or 2015 euros.

Three studies examined aspects of the health impacts of REACH. Another study for DG Environment looked at the occupational health benefits of REACH, in practice focusing almost entirely on the reduction in occupational cancers.⁵¹ It estimated a cumulative 30-year present value of €17.6 – 54.4 billion at 2000 prices, equivalent to annual benefits of €1.2 – 3.8 billion at current prices.

A separate study looked at the potential effects of REACH on three non-cancer occupational diseases caused by chemical exposure (dermatitis, asthma, and chronic obstructive pulmonary disease, COPD).⁵² It concluded that REACH would reduce costs of these diseases over the next 30 years by a present value of €21 – 161 billion at 2004 prices, equivalent to annual benefits of €1.4 – 10.8 billion at current prices.

Finally, a study by two economists analyzed the cumulative value of all the health benefits of REACH over a 15-year period.⁵³ It estimated avoided medical expenditures at €4.8 – 20.1 billion at 2000 prices,

49 DHI Water and Environment (2005), "The Impact of REACH on the Environment and Human Health," DG Environment, http://ec.europa.eu/environment/chemicals/reach/pdf/background/impact_on_environment_report.pdf.

50 In fact, the studies examine complex patterns of time-varying benefits. The simplifying assumption of constant annual benefits facilitates comparison among a wide range of studies.

51 RPA (2003), "Assessment of the impact of the new chemicals policy on occupational health", DG Environment, http://ec.europa.eu/environment/chemicals/reach/pdf/background/finrep_occ_health.pdf. More than 99 percent of the study's estimated monetary benefit was due to reduction in occupational cancers.

52 Simon Pickvance, Jon Karnon, Jean Peters and Karen El-Arifi (2005), "Further Assessment of the Impact of REACH on Occupational Health with a Focus on Skin and Respiratory Diseases," European Trade Union Institute, <http://www.etui.org/Publications2/Reports/The-impact-of-REACH-on-occupational-health-with-a-focus-on-skin-and-respiratory-diseases>.

53 David Pearce and Phoebe Koundouri (2003), "The Social Cost of Chemicals: The Cost and Benefits of Future Chemicals Policy in the European Union," World Wildlife Fund-UK, <http://assets.panda.org/downloads/1654reachcbafindoc.pdf>.

equivalent to €0.6 – 2.4 billion annually at current prices. It also estimated the total value to society of improved health outcomes due to REACH (which is much greater than avoided medical expenditures alone) of €56.7 – 283.5 billion, equivalent to annual benefits of €6.9 – 34.4 billion at current prices.

These estimates of selected benefits of REACH are summarized in Table 5.1. The total shown in the table includes the two studies that are not based on health impacts, plus the estimate for the total social value of health outcomes; other health impact calculations are excluded to avoid double-counting.

Study	Category of benefits	Low estimate	High estimate
<i>(billions of 2014 euros per year)</i>			
TemaNord (2004)	Avoiding one large toxic chemical clean-up	0.5	1.7
DG Environment (2005)	Reduced costs of drinking water purification, sewage sludge and dredging disposal	3.4	10.9
DG Environment (2003)	Reductions in occupational cancer cases	1.2	3.8
Pickvance et al. (2005)	Reductions in non-cancer occupational diseases	1.4	10.8
Pearce and Koundouri (2003)	Avoided medical expenditures	0.6	2.4
Pearce and Koundouri (2003)	Total societal value of health improvements	6.9	34.4
TOTAL	<i>(includes first two lines plus last line)</i>	10.8	47.0

Table 5-1. Estimates of selected benefits of REACH: Annual values at current prices

None of these studies claims to present a complete estimate of all the impacts of REACH. Each analyzes only one portion of the expected benefits. Nonetheless, at the low end of the range of benefits estimated here, a single year's benefits of about €11 billion exceed the total, cumulative costs of REACH. At the high end of this range, REACH alone provides annual benefits of €47 billion, equal to more than one-third of the high end of the claimed total benefits from TTIP (which were €119 billion, as noted in Section 2). The risks of downward harmonization, replacing REACH with something more like America's TSCA, would include the loss of most or all of the benefits of REACH, with annual values, as shown in Table 5.1, in the tens of billions of euros.

6. CLIMATE AND ENERGY REGULATIONS

6.1. Models of regulation

The EU is a world leader in climate policy, already taking significant steps toward a sustainable, low-carbon future. Greenhouse gas (GHG) emissions, as of 2012, were 7-13 tonnes of CO₂-equivalent per capita⁵⁴ in almost all of the EU – still far above a sustainable level, but distinctly lower than the US, at 20 tonnes per capita. To what extent does this difference reflect contrasting regulations and policies?

European and American regulations take very different approaches to the linked problems of climate change and energy policy. The differences are not as stark and simple as in the case of chemicals policy. But there is, nonetheless, a wide gap between the two systems; harmonization to American standards would lead to real losses for Europe.

The European model

The EU has adopted an overall vision, the Energy Roadmap 2050, calling for nearly complete elimination (80 to 95 percent reduction) of greenhouse gases by midcentury. More specific near-term targets are expressed in a series of directives and policies, including the Renewable Energy Directive, the Energy Efficiency Directive, the Clean Air Policy Package, and others. Some initiatives have involved policies enacted at the level of the EU as a whole, such as the EU Emissions Trading System (EU ETS) for greenhouse gas emissions from regulated sectors. In many cases, however, EU decisions call for member states to meet individual targets and adopt national policies implementing the broader directives. For example, the Renewable Energy Directive, calling for 20 percent of total EU energy consumption to come from renewable sources by 2020, sets out national targets ranging from 10 percent for Malta to 49 percent for Sweden, based on local conditions.

In comparison to the American system (described below), there are two outstanding accomplishments of European climate and energy regulation. One is the promotion of renewable energy, which is expanding rapidly. The second is the legitimization of an ongoing process of planning and progress toward long-term goals such as climate protection.

The EU appears to be on track to meet or exceed the 2020 renewables target, even though some member states may fail to reach their individual targets. Discussion is now underway about the targets for 2030 and beyond.⁵⁵ As of 2013, renewable energy represented 25 percent of all EU electricity generation. Biomass, renewable waste, and hydropower are large parts of the renewable energy supply, but wind and solar power are expanding rapidly. The share of EU electricity coming from wind and solar power rose from 1.8 percent in 2004 to 10.2 percent in 2013.⁵⁶ Much of the growth of renewable energy in the EU has come from feed-in tariffs or feed-in premiums for renewable electricity generation, guaranteeing fixed rates – above the market rate for electricity – for a specified number of years.

Beyond the specific results to date in areas such as renewable energy, the success of the European climate and energy policy system is the existence of the system itself. A broad vision, as expressed in the Energy Roadmap and other documents, provides the framework for near-term policies. Success in meeting one round of targets leads to discussion of targets for the next round. Even under the Energy

54 From the EDGAR database, <http://edgar.jrc.ec.europa.eu/>. The only EU countries with GHG emissions for 2012 above 13 tonnes of CO₂-equivalent per capita were Luxembourg (24.1), Estonia (18.0), Ireland (13.6), and the Czech Republic (13.04).

55 European Commission (2014), "Impact Assessment: A policy framework for climate and energy in the period from 2020 up to 2030"; see also European Commission (2011), "Energy Roadmap 2050".

56 Calculated from Eurostat data.

Efficiency Directive, where it will be harder to meet the 2020 target, an EU summit meeting has already agreed to a higher target for 2030.⁵⁷ Progress has slowed due to the economic crisis and the budget constraints faced by many governments, with some prominent voices now calling for rolling back or limiting the scope of energy and climate regulation, but thus far the process itself remains in place.

The legitimacy of long-run environmental goals and planning for future progress is a valuable accomplishment, independent of the specific measures involved. It is essential for climate policy, where decades of negotiation, planning and coordinated international action will be required for success. It is a sharp contrast to the American approach to the same questions.

The American model

The United States had an impressive start in energy and environmental regulation. The Clean Air Act, the Clean Water Act, and other path-breaking measures of the 1970s and early 1980s tackled the urgent problems of mid-twentieth century pollution. But as noted in Section 3, American progress stalled in the 1990s, while Europe moved ahead.

US policy remains strong in regulation of (non-carbon) air pollution, where American limits on common pollutants are generally stricter than European standards. These standards constrain power plant operation, forcing owners of coal plants to clean them up or shut them down. The recent American success in limiting greenhouse gas emissions, often attributed to natural gas displacing coal, is actually due to the combination of cheap gas, the expansion of renewable energy, and regulations that require costly pollution controls at coal plants.

In terms of energy efficiency, national policy in the US is largely confined to standards for vehicle fuel efficiency (either comparable to or slightly weaker than EU rules) and appliance efficiency. The other issues and standards addressed in the EU Energy Efficiency Directive, such as retrofitting buildings, or annual targets for end-use efficiency improvement, are left to the states within the US; some take varying levels of action, while others do nothing at all.

The US has adopted some national-level climate policies, such as the recently proposed Clean Power Plan – although that plan has relatively undemanding targets, relies on opaque, needlessly complex mechanisms (due to constraints imposed by partisan political conflict), and still faces additional judicial challenges before final acceptance. In climate policy, as in energy efficiency, however, most decisions are left to states. Even the Clean Power Plan leaves most choices about implementation up to the individual states.

A few US states match or exceed European standards. California's climate and energy policies might not seem out of place in Europe, and the price of carbon allowances has recently been higher in California than in the EU ETS. A few states have feed-in tariffs for renewables, although often at low levels. But many states, including some with extraordinary wind and solar resources, have done little or nothing about renewables, energy efficiency or climate change. For the country as a whole, renewables are at most half as important as in Europe: all forms of renewable energy, including hydropower and biomass, represented just under 13 percent of US electricity generation in 2013; wind and solar power grew from 0.4 percent of US electricity in 2004 to 4.4 percent in 2013.⁵⁸

Moreover, the United States has no process leading to steady progress in implementing long-run climate and energy goals. Rather, an agency committed to cost-benefit analysis, the Office of Management

⁵⁷ The Energy Efficiency Directive calls for reducing final energy consumption in 2020 to 20 percent below a business-as-usual baseline projection. An EU summit meeting in 2014 agreed to a 27 percent target for 2030.

⁵⁸ Calculated from Energy Information Administration (EIA) data.

and Budget, has been established as the gatekeeper, requiring detailed economic justification for each proposed action. Continuity of policy and planning is not guaranteed; the modest federal subsidy for wind power has repeatedly been stopped by legislative conflict and then later restarted, disrupting long-term development of the industry. There is only the vaguest commitment to long-term reduction of greenhouse gas emissions, and no political process that translates that commitment into an ongoing series of actions.

6.2. Benefits of climate and energy policies

The benefits of EU climate and energy policies include reductions in greenhouse gas emissions, reductions in other air pollutants, and employment in renewable energy industries.

The goal of climate policy is to reduce the carbon emissions that contribute to climate change. Generation of electricity from renewable sources avoids the carbon emissions from fossil fuel combustion. The European Commission's 2015 progress report on renewable energy, together with a related technical report from the European Environment Agency (EEA), document the results to date: for the EU as a whole in 2013, the increase in renewable energy since 2005 avoided the emission of 388 million tonnes of CO₂, and avoided the combustion of 54.3 million tonnes of oil equivalent (Mtoe) of solid fossil fuels (hard coal, lignite, and peat; hereafter referred to simply as "coal").⁵⁹ The reduction in the cost of imported fuel resulting from the growth of renewable energy amounted to at least €30 billion per year.

The social cost of carbon

Many attempts have been made to estimate the "social cost of carbon" (SCC), the monetary value of the damages caused by a tonne of CO₂ emissions. Climate risks are increasingly serious but uncertain as to timing and exact magnitude, so estimates of the SCC have varied widely. Meanwhile, the price of carbon emissions on the EU ETS has been low in recent years, as a result of excessive past allocation of allowances and the continuing effects of the economic slump. For planning purposes the European Commission has assumed that in 2030, when the ETS is projected to reach 100 percent auctioning of allowances, the price of carbon emissions will be €35/t.⁶⁰ The US government's SCC estimate, used in cost-benefit analyses, is broadly similar: \$40/t in 2015, rising to \$56/t in 2030 and \$77/t in 2050.⁶¹

Research on the SCC has pointed out that US estimates are based on three economic models which minimize or overlook the risks of catastrophic, irreversible, or unexpectedly rapid climate change. Modifications of the same models to include such risks have repeatedly produced much higher values: \$220/t in one study, and a broad range of uncertainty with worst-case values as high as \$900/t in another.⁶² The Stern Review, the UK government report that transformed the economics of climate change in 2006, estimated an SCC of \$85/t. More recently, adopting one of the models used in the US SCC calculation, Simon Dietz and Nicholas Stern have estimated that the SCC should be \$32-103/t in 2015, rising to \$82-260/t within two decades.⁶³ A literature review of SCC estimates concluded that

59 European Commission (2015), "Renewable energy progress report"; European Environment Agency (2015), "Renewable energy in Europe - approximated recent growth and knock-on effects".

60 European Commission (2014), see note 51. This is the projected price in 2030 in the reference scenario, based on policies already adopted; other scenarios have carbon prices in 2030 ranging from €11/t to €53/t (see table, page 140).

61 US EPA (2015), "The Social Cost of Carbon," <http://www.epa.gov/climatechange/EPAactivities/economics/scc.html>.

62 Frances C. Moore and Delavane B. Diaz (2015), "Temperature impacts on economic growth warrant stringent mitigation policy," *Nature Climate Change* 5:127-131; Frank Ackerman and Elizabeth A. Stanton (2012), "Climate Risks and Carbon Prices: Revising the Social Cost of Carbon," *Economics E-journal* 6.

63 Simon Dietz and Nicholas Stern (2015), "Endogenous growth, convexity of damage and climate risk: How Nordhaus framework supports deep cuts in carbon emissions," *Economic Journal* 125, 574-620.

the SCC, adjusted for the known risks of climate change, should be at least \$125/t.⁶⁴ The European Commission has projected the SCC at €100/t in 2050, roughly in line with many of the higher, risk-based values found in recent academic research.⁶⁵

Using the two European Commission values of €35/t and €100/t (which are roughly equivalent, respectively, to the current US government estimate, and the higher estimates emerging from recent research), the reduction of 388 million tonnes in CO₂ emissions due to renewable energy in 2013 was worth either €13.6 billion or €38.8 billion.

Health impacts of coal plants

The EEA has analyzed the costs of air pollution from European industrial facilities.⁶⁶ From 2008 to 2012, EEA estimates that the health effects of industrial air pollution, excluding climate impacts, had an average annual value of €47 – 135 billion. Two-thirds of the effects of industrial air pollution, in the EEA study, are attributable to the energy sector, primarily coal-burning power plants.

Using the same data sources as EEA, the Health and Environment Alliance (HEAL) has produced estimates specifically focused on coal plants.⁶⁷ The health costs of electricity produced from coal, for the EU-27, are, on average, €0.0585 per kWh at today's prices.⁶⁸ Most of the damages represent premature deaths or serious illnesses such as chronic bronchitis caused by air pollution. Similar research has found somewhat lower but still significant values for the United States; the difference could be due to lower population density in areas near American coal plants, and/or stricter US air pollution controls that have reduced damages.⁶⁹

Since the growth of renewable energy avoided the combustion of 54.3 Mtoe of coal combustion in the EU in 2013, it also avoided €14.8 billion of health damages, according to the HEAL cost estimate.⁷⁰

Employment in renewable energy industries

The benefits of renewable energy also include its positive contribution to the European economy. It is an established industry, which now creates more than one million jobs. Table 61 presents estimates of jobs created in renewable energy (including manufacturing, installation, and operations) for the EU as a whole, and for the top two countries, Germany and Spain, in 2012-2013.⁷¹

64 J.C.J.M. van den Bergh and W.J.W. Botzen (2014), "A lower bound to the social cost of CO₂ emissions," *Nature Climate Change* 4, 253-258.

65 European Commission (2014), see note 51. This is the value for the reference scenario; other scenarios have generally higher SCC values in 2050.

66 European Environment Agency (2014), "Costs of air pollution from European industrial facilities 2008 – 2012 – an updated assessment". Values are in 2005 euros. The range of values reflects differing hypotheses about valuation of mortality.

67 HEAL (2013), "The unpaid health bill: How coal power plants make us sick".

68 HEAL reported an EU-27 average of €0.053 per kWh, apparently in 2009 euros; it has been updated to 2014 prices.

69 National Research Council (2010), *Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use* (Washington DC: National Academies Press) estimates \$0.0365/kWh average damages from coal plants in 2014 prices. Nicholas Z. Muller, Robert Mendelsohn, and William Nordhaus (2011), "Environmental accounting for pollution in the United States economy," *American Economic Review* 101, 1649-1675, estimates \$0.0385/kWh in 2014 prices.

70 This assumes 40 percent energy efficiency in conversion of coal to electricity, which is the average of the four latest (2011) European values in Ecofys (2014), "International comparison of fossil power efficiency and CO₂ intensity - update 2014." It also assumes that all industrial uses of coal cause pollution at a rate equivalent to electricity generation.

71 Calculated from International Renewable Energy Agency (IRENA), "Renewable Energy and Jobs: Annual Review 2014." Job estimates are for 2013 in Germany and for 2012 in the rest of the EU. "Other" renewable jobs are in geothermal and small hydropower; large hydropower facilities are not included.

	EU Total	Germany (thousands of jobs)	Spain
Biomass	486	127	48
Wind	328	138	24
Solar	292	68	40
Other renewables	141	38	3
TOTAL	1246	371	114

Table 6-1. Direct and indirect jobs in renewable energy, 2012-13.

Source: IRENA, "Renewable Energy and Jobs: Annual Review 2014".

Cost-benefit analyses have often ignored changes in employment, perhaps based on economic theories that assume that full employment normally prevails. However, this assumption is difficult to sustain in a world of persistent high unemployment. Responding to this reality, US EPA has recently begun to consider the inclusion of employment effects of regulations in its cost-benefit calculations. A detailed study of the value of job loss, emerging from EPA's discussions, concludes that the social value of a change in employment includes the change in earnings, the change in the value of non-working time and the long-run effects of unemployment, and the change in tax revenues that are tied to employment.⁷² The study finds that the value of a job depends on the level of unemployment; at a 10 percent unemployment rate, close to the current EU average, the estimated social value of a change in employment is 19.0 to 24.7 percent of the change in earnings.⁷³

These ratios can be applied to the jobs created by renewable energy in Europe. Assuming an average annual income of €30,000, the total payroll in jobs created by renewable energy is €37.4 billion.⁷⁴ The social value of these jobs, at 19 to 24.7 percent of earnings, is €7.1 – 9.2 billion.

The value of the climate, health and employment benefits of renewable energy, summarized in Table 6-2, is half of the total projected benefits of TTIP, as seen in Section 2.

Category	Avoided impact or benefit	Unit value	Total benefit
			(billions of 2014 euros)
Climate benefits	388 Mt CO ₂ emissions	€35 – 100/t	13.6 – 38.8
Health benefits	54.3 Mtoe coal combustion	€0.0585/kwh	14.8
Employment benefits	1,246,000 jobs	19.0 – 24.7% of wages	7.1 – 9.2
TOTAL			35.5 – 62.8

Table 6-2. Annual climate, health and employment benefits of EU renewable energy

⁷² Timothy J. Bartik (2015), "The social value of job loss and its effect on the costs of U.S. environmental regulation", *Review of Environmental Economics and Policy* 9, 179-197.

⁷³ Bartik (2015), Table 2, p.186.

⁷⁴ Eurostat reports an EU average hourly labor cost of €24.60 in 2014, of which 24.4 percent was non-wage costs paid by the employer; this implies an average hourly wage of €18.60 (http://ec.europa.eu/eurostat/statistics-explained/index.php/Wages_and_labour_costs). This is equivalent to €30,000 for a year of just over 1600 hours of work.

This may be a conservative estimate, since there is some evidence that wages are higher in renewable energy jobs than in other jobs in the same industries: Manfred Antoni, Markus Janser, and Florian Lehmer (2014), "The hidden winners of renewable energy promotion: Insights into sector-specific wage differentials", IAB Discussion Paper, <http://www.econstor.eu/handle/10419/103059>.

6.3. Risks of harmonization

Harmonization of US and EU regulations under TTIP could put pressure on EU climate and energy regulations. The United States does not have Europe's broad commitments to climate and energy policy. When policies create differential costs, it could be argued that they are barriers to trade. The existence of the EU ETS, EU renewables and energy efficiency targets, and policies such as feed-in tariffs that subsidize renewables, might be seen by some investors as unfairly penalizing non-renewable energy sources. As described in Section 4, Vattenfall has already sued for damages from Germany's regulation of coal plants and decision to phase out nuclear power. TTIP might allow American firms to do the same.

If TTIP rewrites or overrules climate and energy regulations, the result could be the loss of some or all of the health and climate benefits from renewables, and the million-plus jobs in the industry. More broadly, it could mean a slowdown or reversal in Europe's progress toward a cleaner, sustainable, low-carbon energy system. Harmonization of EU standards to US levels would harm the worldwide efforts to reduce carbon emissions and limit the damage from climate change. An increased reliance on coal would also mean more air pollution, a step backward for human health in Europe.

7. FOOD AND AGRICULTURE

7.1. Trade and regulatory background

Both Europe and America have numerous, detailed regulations affecting food and agriculture. In both the US and the EU, tariffs are higher and non-tariff measures affecting trade are more important in agriculture than in industry.⁷⁵ Feelings run high in this area; as of early 2016, it was one of the remaining areas of unresolved differences between the two sides, along with the ISDS issue discussed earlier.

The EU currently has a trade surplus with the US in the combined areas of agriculture, food and beverages, thanks in no small part to the American appetite for European wine. That surplus could quickly turn into a European deficit in food and agriculture if trade were fully liberalized.

Liberalization of trade in food and agriculture would lead to an increase in trade in both directions – but US exports would expand by more, leading to a net gain for the US and a net loss for the EU in agriculture. A study for the European Parliament finds that, under its principal scenario for liberalization, EU food and agriculture exports to the US would increase by about 60 percent, while imports from the US would increase by about 120 percent. Agricultural value added would fall by 0.5 percent in the EU and rise by 0.4 percent in the US. The study concludes, in part:

- ... Compared to their US counterparts, EU producers may be disadvantaged by the extra costs involved in complying with EU regulations. This is most relevant regarding EU constraints on the use of genetically modified organisms (GMOs), on pesticide use, and on food safety measures in the meat sector.
- If regulatory convergence were to level the playing field, there would be a risk of downward harmonisation... this could lead to major changes in EU legislation, which may undermine the traditional EU precaution and risk management policy on which the current regulatory framework is based.⁷⁶

The United States has a large, low-cost agricultural sector, both because of its natural resources and because it has generally weaker, less protective regulations governing health, safety and environmental impacts in agriculture and food production. As in the case of chemicals policy, European food and agriculture policies are based on a precautionary approach to health and environmental risks while American policies are based on calculations of expected risk, cost-benefit analysis, and least-cost risk management options.

A comparison of the two approaches appears on the US EPA website, in a discussion of European policy toward pesticides that are harmful to bees, and are a potential cause of bee colony collapse disorder.⁷⁷ In 2013 the European Commission, responding to a scientific report from the European Food Safety Authority (EFSA), restricted the use of three neonicotinoid pesticides (clothianidin, imidacloprid and thiametoxam) because they posed “high acute risks” to bees.

There is no transatlantic dispute about the science: According to US EPA, “Based on currently available data, the EPA’s scientific conclusions are similar to those expressed in the EFSA report ...” However, EPA explained that this was not sufficient for regulation in the United States, because the EFSA report did

⁷⁵ Jean-Cristophe Bureau et al. (2014), “Risks and Opportunities for the EU Agri-Food Sector in a Possible EU-US Trade Agreement,” DG Internal Policies, Policy Department B: Structural and Cohesion Policies.

⁷⁶ Bureau et al. (2014), p. 12.

⁷⁷ US EPA (2013), “Colony collapse disorder: European bans on neonicotinoid pesticides”, <http://www.epa.gov/pesticides/about/intheworks/ccd-european-ban.html>.

not address options for risk management. EPA could only say that the three pesticides are not being banned or severely restricted in the US, but “are currently being re-evaluated ...”

Trade liberalization could lead to expanded US food exports, with serious adverse consequences for EU production of beef, poultry, corn and wheat, as well as several other sectors. Moreover, the entire fabric of precautionary regulation of health and environmental risks could be endangered, depending on the approach taken to harmonization in a liberalized trading environment. Among many other differences with EU standards, US regulations accept more pesticides, more genetically modified crops, and more potentially hazardous practices in meat production and preparation, while doing less to protect animal welfare.

7.2. Benefits of regulation

A study of farmers’ cost of compliance with EU legislation, commissioned by the European Commission, describes multiple categories of benefits of agricultural regulation.⁷⁸ There are economic and cultural benefits – for example, farmers may receive economic benefits from agricultural regulation and policies, including subsidies, reduced transaction costs (such as better information), and additional revenues from selling higher-quality products that are more in demand. Other citizens may value the role of farmers in preserving a culturally preferred, heterogeneous landscape with small producers and traditional settlements.

There are also multiple health and environmental benefits from food and agricultural regulation. Reduced use of hazardous pesticides protects the health of farmers, farm workers and rural communities, the safety of food, and the biodiversity of the natural environment. Food safety standards protect the health of consumers and reduce foodborne illnesses. Animal welfare standards protect an increasingly important social value. Environmental standards for farming promote goals such as clean water, biodiversity, and greenhouse gas reduction.

It is difficult to calculate precise values for individual benefits of food and agricultural regulation, for several reasons. Farmers and farm workers are typically exposed to multiple pesticides, making it hard to determine which chemicals are causing adverse effects. Many regulations, such as food safety standards and procedures that have slowed the adoption of genetically modified organisms, are intended to prevent worst-case outcomes; in these cases the evaluation of benefits depends on the unknown magnitude of the occasional, extreme losses that have been prevented.

There appear to be more American than European studies of food and agricultural impacts, and there are few, from any location, that lead to precise numerical estimates of the monetary value of regulatory benefits. Nonetheless, the available evidence, described below, makes it clear that the health and environmental benefits of European food and agricultural regulations are worth billions of euros per year.

7.3. Reduced pesticide use

The European Union regulates pesticides more strictly than the United States does, as shown by the story of neonicotinoid pesticides and the harm to bee colonies. A survey of pesticide regulations found that there are at least 82 pesticides banned in the EU but allowed in the US, including 9 known carcinogens and 6 others classified as “extremely hazardous” by the World Health Organization.⁷⁹ The

⁷⁸ Centro Richerche Produzioni Animali (CRPA, 2014), “Assessing farmers’ cost of compliance with EU legislation in the fields of environment, animal welfare and food safety”, DG-Agriculture and Rural Development

⁷⁹ Center for International Environmental Law (2015), “Lowest Common Denominator: How the proposed EU-US trade deal threatens to lower standards of protection from toxic pesticides,” http://ciel.org/Publications/LCD_TTIP_Jan2015.pdf

same report compared 36 standards for allowable maximum pesticide residue levels in food, finding that EU standards were stricter in 33 cases. In 8 of the 36 comparisons, allowable concentrations of pesticide residues in food were 100 or more times as great in the US as in the EU.⁸⁰

There are few studies of the overall impacts of pesticides. One study examined known health effects of the top pesticides used in eight crop categories in each country of the EU-24 in 2003.⁸¹ These pesticides, which accounted for about half of the total mass of pesticides applied in Europe that year, caused annual health impacts equal to the loss of about 2000 disability-adjusted life years (DALYs). Using conventional values for DALYs, this amounted to annual damage costs of €78 million. One-fifth of that damage came from substances that are now banned from the European market. Although there were 133 pesticides included in the study, 90 percent of the damage was due to just 13 of them – raising the possibility that safer substitutes for a handful of pesticides could lead to substantial improvement.

According to a review of research on the subject, most studies find evidence that pesticides increase risks of major health damages.⁸² For example, 31 out of 43 studies find that for those directly exposed to pesticides (such as farmers and farm workers), exposure to some pesticides significantly increases the risk of cancer. Similarly, 11 out of 13 studies find that direct exposure to pesticides increases the risk of respiratory disease. For those with indirect exposure to pesticides (such as farmers' family members or other residents of farming areas), 13 out of 16 studies find a significant link to increased risk of cancer. In contrast, there were fewer studies of health risks to consumers from pesticide residues in food, some finding cancer risks from specific residues such as DDT.

Apparently the only comprehensive valuation of the effects of pesticides as a whole is the work of David Pimentel. He estimates that US pesticide use totals 500 million kg per year, including more than 600 different substances.⁸³ According to Pimentel's 2005 study, health and environmental damages from US pesticide use amount to \$9.6 billion per year, including \$1.2 billion in public health impacts; \$1.5 billion costs of increased pesticide resistance; \$1.4 billion in crop losses due to pesticide misuse, overuse, or drift; \$2.2 billion in bird losses due to pesticides; \$2.0 billion in the costs of monitoring and cleaning groundwater; and several smaller categories. The public health impacts are based on estimates of 35,000 poisonings (5,000 serious enough to require hospitalization), 10,000 new cases of cancer, and 45 accidental fatalities caused by pesticide use each year.

Pimentel's calculation of damages from US pesticide use is equivalent to €25 per hectare of agricultural land today, or €4.3 billion if applied to the EU as a whole.⁸⁴ In other words, if the EU had the same intensity of pesticide hazards per farm hectare as the US, it would, according to Pimentel's estimate, suffer €4.3 billion of annual health and environmental damages from pesticides. Some of that amount is already avoided by EU standards for pesticide use, and more could be avoided by stricter regulation.

The harm caused to bees by pesticides, and the consequent risk of losing the valuable pollination services provided by bees, has been a focus of recent research. A literature review identified 27 studies

80 Calculated from Table 2 in Center for International Environmental Law (2015).

81 Peter Fantke, Rainer Friedrich and Olivier Jolliet (2012), "Health impact and damage cost assessment of pesticides in Europe", *Environment International* 49, 9-17.

82 Henrik Andersson, Damian Tago and Nicolas Treich (2014), "Pesticides and health: A review of evidence on health effects, valuation of risks, and benefit-cost analysis", Working Paper IDEI-825, Toulouse School of Economics.

83 David Pimentel (2005), "Environmental and economic costs of the application of pesticides primarily in the United States", *Environment, Development and Sustainability* 7, 229-252. Andersson et al. (2014) confirm that Pimentel's work is the only comprehensive analysis of overall pesticide impacts.

84 This calculation is based on agricultural areas of 372 million hectares in the US and 174 million hectares in the EU. It assumes Pimentel's estimates are in 2003 dollars, converted to 2014 dollars using the US consumer price index and then converted to 2014 euros at €1.00 = \$1.33.

worldwide on the economic value of pollination.⁸⁵ Seven of the studies evaluated pollination services in Europe, as shown in Table 7.1 (next page). Although no systematic totals are available, these studies suggest that the pollination services provided by bees have a value to European agriculture of billions of euros per year – a value that could be at risk if pesticides were to cause loss of bee populations.

Date of study	Country (crop)	Value of pollination services (millions of 2014 euros, except as noted)
2006	Poland	739
1998	UK	458
2008	Spain (glasshouse)	668
2014	UK (apples)	52
2014	EU (strawberries)	1067
2013	Ireland (oilseed rape)	5
1998	Italy (plums)	€389 / hectare

Table 7-1. Estimates of the value of pollination services in Europe

Source: Hanley et al. (2015), Table 1. Values reported in 2010 pounds were converted to 2014 pounds and then converted to 2014 euros at €1.00 = £0.806. See Hanley et al. (2015) for citations to original studies.

Box: Who benefits from atrazine?

The economic benefits of chemical-intensive agriculture have often been exaggerated in American debate. Atrazine, a potent herbicide, is sprayed on most of the tens of millions of hectares of maize grown in the United States, making it the world's second most widely used pesticide, after glyphosate. Although banned in Europe, atrazine is produced by a Swiss company, Syngenta. It is known to cause endocrine disruption in amphibians and other species, even at concentrations of 1 part per billion or less in surface water. Defenders of atrazine claim that it is economically essential to American agriculture, yet their own studies project that it increases maize yields by only 4 to 6 percent; independent studies have sometimes found yield gains of only 1 to 3 percent.⁸⁶

The latest Syngenta-sponsored studies of the benefits of atrazine find that it causes a 4.4 percent increase in maize yields – and an 8.0 percent drop in maize prices. As a result, farmers as a group receive lower total revenues for their crop when they all use atrazine. The claimed net social benefits of atrazine consist solely of the indirect benefits to consumers from lower maize prices, such as slightly cheaper beef and biofuels; the estimated gains to consumers are larger than the losses to farmers.⁸⁷

7.4. Food safety and foodborne illnesses

A number of chemicals used in raising livestock and preparing meat have become the subject of international disputes, with sufficient evidence of harm to trigger precautionary policies in Europe, but not enough for proof of the need for action by American standards. Those disputes could arise again under TTIP.

Ractopamine, used to promote rapid, lean growth of pigs in the United States, is known to cause elevated heart rates and other stress-related symptoms. A study of the effects of ractopamine in

⁸⁵ Nick Hanley, Tom D. Breeze, Ciaran Ellis and David Goulson (2015), "Measuring the economic value of pollination services: Principles, evidence and knowledge gaps", *Ecosystem Services* 14, 124-132.

⁸⁶ Frank Ackerman (2007), "The economics of atrazine," *International Journal of Occupational and Environmental Health* 13, 441-449; Frank Ackerman, Melissa Whited and Patrick Knight (2014), "Would banning atrazine benefit farmers?", *International Journal of Occupational and Environmental Health* 20, 61-70.

⁸⁷ Maize is not the only input in the production of either beef or biofuels, so the resulting price decreases to final consumers are much less than 8 percent. See Ackerman, Whited and Knight (2014).

humans used six healthy, young adult volunteers; one of the six had to drop out of the study because of adverse health effects. The Sichuan Pork Trade Chamber of Commerce reports that 1,700 people in China were poisoned by eating pork containing ractopamine between 1998 and 2010.⁸⁸ Ractopamine is now banned in China, Russia, the EU and many other countries, but not in the United States.

Poultry produced in the US is usually treated with antimicrobial chemical rinses, including chlorine dioxide, a toxic chemical. The EU has banned chemically rinsed poultry since 1997, calling instead for strict sanitary standards in poultry production and processing. The US has been challenging this EU policy since 2002, because it excludes most American poultry production from the EU market.⁸⁹ There is debate about the level of risk posed by US chemical rinses. The European Food Safety Authority (EFSA) has found no major safety concerns with the use of some chemical rinses for poultry, nor has the Codex Alimentarius Commission (Codex). Scientific committees under the auspices of the European Commission, however, have concluded that there is not enough data to make a comprehensive assessment of the full range of risks involved in chemical rinses.⁹⁰

US positions may be particularly intransigent on this issue; a US government report on the subject says, "The U.S. poultry industry has indicated that it is unlikely to support a TTIP agreement that does not provide for better access to the EU of U.S. poultry products."⁹¹ On the other hand, a description of US poultry inspection practices makes clear that the system relies primarily on self-inspection by producers, combined with computer modeling of pathogen detection data – and that high levels of pathogens have been detected on random samples of chemically rinsed, commercially distributed US poultry.⁹²

An even longer-standing dispute concerns the use of growth-promoting hormones in beef. Most US beef production uses hormones, while the EU bans hormone-raised beef. As a result, only a small quantity of US beef, certified to have been raised without hormones, can be sold in Europe.⁹³ Both the EU ban on hormone-treated meat and US challenges to the ban date back to the 1980s. World Trade Organization (WTO) dispute settlement processes have repeatedly been used in an attempt to resolve the conflict; the latest WTO ruling, in 2008, is mixed, allowing the continuation of both the EU ban on hormone-treated beef, and US and Canadian trade sanctions in retaliation against the ban. At least four EU scientific reviews of the issue have concluded that there is not enough data for a quantitative assessment that could demonstrate the absence of risk. As an EFSA panel concluded in the latest official European review of the issue, in 2007,

... epidemiological data provide convincing evidence for an association between the amount of red meat consumed and certain forms of hormone-dependent cancers. Whether hormone residues in meat contribute to this risk is currently unknown.⁹⁴

⁸⁸ Center for Food Safety (2013), "Ractopamine Factsheet," http://www.centerforfoodsafety.org/files/ractopamine_fact-sheet_02211.pdf.

⁸⁹ Renée Johnson (2015), "US-EU Poultry Dispute on the Use of Pathogen Reduction Treatments (PRTs)," Congressional Research Service, Washington DC.

⁹⁰ Johnson (2015), 3.

⁹¹ Johnson (2015), 6.

⁹² Steve Suppan (2015), "Food Import Re-Inspection and the 'High Standards' of 21st Century Trade Agreements", http://www.iatp.org/files/2015_10_06_GFMS_SS.pdf.

⁹³ Renée Johnson (2015a), "The US-EU Beef Hormone Dispute," Congressional Research Service, Washington DC.

⁹⁴ As quoted in Johnson (2015a), 8.

Box: Foodborne illness in America

Do transatlantic differences in food safety regulations lead to different rates of foodborne illnesses? Most observers have concluded that it is impossible to make a meaningful comparison of American and European rates of foodborne illness, due to differences in diet, disease patterns, data sources, and medical standards. One widely publicized commentary recently concluded that rates of foodborne illness are higher in Europe than in America.⁹⁵ That comment, from a consulting firm that frequently works for the American agribusiness industry, based its US illness data on the Foodnet survey, which counts the confirmed cases of ten leading pathogens in a fraction (15 percent) of the US population.

Researchers at the US government's Centers for Disease Control and Prevention (CDC) periodically produce more complete estimates of foodborne illness, based on Foodnet and many other data sources. The latest CDC estimate, using data for 2000-2008, finds an annual total of roughly 48 million new cases of disease, 128,000 hospitalizations, and 3,000 deaths. Using conventional American cost-benefit valuations, the annual cost of foodborne illness was \$77.7 billion.⁹⁶ That amount is equivalent to €212 per capita at current prices.⁹⁷

There are no directly comparable estimates for the EU. Regular surveys of foodborne illnesses in Europe are available, although based on a very different methodology.⁹⁸

The importance of food safety standards becomes clear on the occasions when they fail, leading to massive and costly outbreaks of foodborne illnesses. The BSE crisis of the 1990s led to more than 200 human deaths, most of them in the UK. Sales of beef in the UK immediately declined by 40 percent, millions of animals were destroyed, and economic losses included an estimated 4 billion pounds spent by the British government, along with private sector losses of more than a billion pounds in the first year of the crisis.⁹⁹ Restrictions on UK beef exports resulting from the crisis were not completely eliminated until 2006. A different livestock disease crisis in the UK, the foot-and-mouth disease outbreak of 2001, had an estimated total cost to the British economy of £8 billion.¹⁰⁰ Prevention of such epidemics is a crucial and valuable goal of food safety regulation, although there is no obvious way to assign a specific monetary value to this benefit.

7.5. Animal welfare

The European Commission and member states have been promoting animal welfare for over 40 years, with rules ensuring that farm animals enjoy freedom from hunger, thirst, pain, disease, fear, distress, and

95 Jennifer McEntire (2014), "Foodborne Illness: How do the U.S. and EU Compare?", <http://achesongroup.com/2014/03/foodborne-illness-us-eu-compare/>.

96 Robert L. Scharff (2012), "Economic burden from health losses due to foodborne illness in the United States", Journal of Food Protection 75, 123-131.

97 Monetary estimates in Scharff (2012) are in 2010 dollars, and based on a 2006 US population of 299 million.

98 For example, EFSA and European Centre for Disease Prevention and Control (2015), "The European Union summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in 2013", EFSA Journal 13, 3991.

99 Nigel Atkinson (2001), "The Impact of BSE on the UK Economy," <http://www.veterinaria.org/revistas/vetenfinf/bse/14Atkinson.html>; Patrick von Swanenbergh and Erik Millstone (2002), "Mad cow disease 1980s – 2000: How reassurances undermined precaution", in EEA (2002), Late Lessons from Early Warnings.

100 As cited in Centro Ricerche Produzioni Animali (CRPA) et al. (2014), "Assessing farmers' cost of compliance with EU legislation in the fields of environment, animal welfare and food safety," European Commission, http://ec.europa.eu/agriculture/external-studies/2014/farmer-costs/fulltext_en.pdf.

freedom to express normal behavior.¹⁰¹ Important accomplishment in this area include the elimination of battery cages for hens, improved space and standards for pigs, a ban on animal testing for cosmetics, and continuous improvement in animal transport conditions.

Regulation of the treatment of farm animals aims to improve the welfare of the animals involved, but there is of course no way to ask the animals about how much they value humane treatment. In most cases, the only information available about the monetary value of this benefit concerns the importance that people place on animal welfare. (In some cases, there could also be information about the costs of livestock diseases caused by animal welfare abuse.) For some people, animal rights are a matter of ethical principles and moral obligation. For many people, better treatment of farm animals has a direct economic value, reflected in willingness to pay for humanely produced food.

Several studies have estimated consumer willingness to pay for meat produced according to animal welfare standards. A UK study found that consumers were willing to pay 26 to 34 percent more for meat from animals that enjoyed good to excellent animal welfare.¹⁰² A German study similarly found most consumers willing to pay 27 percent more for meat from chickens certified to meet high animal welfare standards.¹⁰³ Another study found that Spanish consumers were willing to pay 19 to 23 percent more than the market price for cured ham with an EU Animal Welfare label, indicating that it meets animal welfare standards higher than current legal requirements.¹⁰⁴

One survey of research on these topics concluded that consumers are on average willing to pay 22 percent more than the base price of meat for additional assurances about food safety, and 14 percent for assurances about high levels of animal welfare.¹⁰⁵ Another survey found that willingness to pay for animal welfare varied little from one country to another, and increased with income; consumers consistently showed high interest in the treatment of hens and the elimination of battery cages.¹⁰⁶

A recent cost-benefit analysis estimated the value to American consumers of a national standard requiring cage-free egg production.¹⁰⁷ Currently only two states, California and Michigan, have adopted that requirement. The study distinguished between the direct value to consumers of consuming eggs from cage-free hens, and the indirect, altruistic benefit of knowing that all hens are guaranteed a cage-free existence. Based on earlier research, the study assumed that one-third of American consumers have no interest in whether eggs come from cage-free hens; the majority would enjoy the direct personal value of cage-free eggs, and a small minority (rising from 6 to 12 percent over the next 15 years) would experience a larger altruistic benefit. The net effect for all US consumers was a projected cumulative net present value of \$27 billion over 15 years, or \$9.80 (€7.40) per person per year.¹⁰⁸

101 See http://ec.europa.eu/food/animals/welfare/index_en.htm.

102 A. Kehlbacher, R. Bennett and K. Balcombe (2012), "Measuring the consumer benefits of improving farm animal welfare to inform welfare labeling," *Food Policy* 37, 627-633.

103 Fadi Makdisi and Rainer Marggraf (2011), "Consumer willingness-to-pay for farm animal welfare in Germany - The case of broiler", University of Göttingen.

104 Azucena Gracia, Maria L. Loureiro and Rodolfo M. Nayga, Jr. (2011), "Valuing an EU animal welfare label using experimental auctions", *Agricultural Economics* 42, 669-677.

105 Gianni Ciccia and Francesca Colantuoni (2010), "WTP for traceable meat attributes: A meta-analysis", *International Journal on Food System Dynamics* 1, 252-263.

106 Carl Johan Lagerkvist and Sebastian Hess (2011), "A meta-analysis of consumer willingness to pay for farm animal welfare", *European Review of Agricultural Economics* 38, 55-78. Most of the studies included in the meta-analysis were from Sweden, UK, or USA.

107 Jonathan Ward (2014), "From battery cages to barns: A cost-benefit analysis of a national standard for cage-free egg production", University of Massachusetts-Amherst, http://scholarworks.umass.edu/cgi/viewcontent.cgi?article=1031&context=cpaa_capstones.

108 Ward projects a cumulative 15-year net present value benefit to consumers of \$57.8 billion, offset by \$30.3 billion of lost consumer surplus due to higher-priced eggs. The net present value is \$27.5 billion. Converted to an annual benefit (see box in Section 5), this is \$3.02 billion per year. Over the 15-year period studied, the projected population of the United States

If the same value per person applied in Europe, then the ban on battery cages would be worth €3.7 billion per year to the EU as a whole. On the one hand, American values might be too high, since average incomes are higher in the US. On the other hand, American values might be too low, if the proportion of the population experiencing large altruistic benefits from animal welfare is larger in Europe.

averages 339.5 million. Ward's estimates appear to be in 2008 dollars, the date of the underlying survey research; they were inflated to 2015 dollars using the US consumer price index and then converted to 2014 euros at €1.00 = \$1.33. The EU total value is based on a population of 503 million.

8. OTHER AREAS OF REGULATION

The three areas of regulation examined in depth in the preceding sections – chemicals policy, climate and energy, and food and agriculture – are not the only cases in which important benefits of regulation could be lost by a process of downward harmonization under TTIP. To suggest the broader range of regulatory concerns, this section briefly looks at three other areas: public procurement policy; data services and privacy; and labor regulations, focusing on limits on working time.

8.1. Public Procurement

Public procurement – spending by public authorities on works, goods and services – amounts to about 18 percent of Europe's GDP.¹⁰⁹ Procurement standards are set by numerous national, regional and local authorities, frequently favoring the lowest-price bidder. Yet there are many goals for procurement, beyond merely minimizing costs. There is a growing awareness of procurement as a mechanism that can drive policy change in several areas.¹¹⁰ An exclusive focus on cost reduction could jeopardize the quality of infrastructure and services, and could create pressure for contractors to reduce wages and ignore environmental standards. On the other hand, multiple criteria for evaluation of tenders creates subtle problems of scoring, which local authorities may not always understand.¹¹¹

New EU rules on procurement, adopted in 2014, expand on a similar initiative in 2004, allowing environmental and social concerns to be taken into account when awarding public contracts.¹¹² Contracting authorities can develop criteria for the “most economically advantageous tender,” incorporating environmental, social and product quality criteria along with price. Under the new rules, life-cycle costing, including externalities associated with producing a product, can be taken into account. The process by which goods and services are produced can be considered, allowing authorities to favor tenders that hire the long-term unemployed or other disadvantaged groups. Abnormally low tenders can be asked to explain their low prices, and can be rejected if their prices are based on violation of EU or national laws and standards.

The 2014 rules also streamline and simplify the procurement process, expanding opportunities for small and medium enterprises and facilitating cross-border tenders within Europe. The new rules were applauded by representatives of parties across the political spectrum, and appear to be broadly popular.¹¹³ They will not, however, be popular in the context of TTIP or other trade negotiations. One of the fundamental, long-standing principles of the World Trade Organization is that countries cannot restrict the process by which products are made; such restrictions have repeatedly been rejected as unfair restraints of trade. Thus the EU rules on procurement could be perceived as a barrier to trade.

A detailed review of potential non-tariff barriers to trade between the EU and the US, conducted in 2009, identified public procurement policies as obstacles to trade in both directions.¹¹⁴ The US has numerous procurement rules that limit or exclude European firms, including extensive national security-based restrictions and other “Buy American” policies, requirements to use US-flag vessels for cargo shipping,

¹⁰⁹ EurActiv (2014), “EU brings innovation into public procurement rules,” 15 January 2014, <http://www.euractiv.com/future-eu-parliament-approves-new-rules-pu-news-532783>.

¹¹⁰ Fernando Correia et al. (2013), “Low carbon procurement: An emerging agenda,” Journal of Purchasing and Supply Management, 58-64.

¹¹¹ Mats A. Bergman and Sofia Lundberg (2013), “Tender evaluation and supplier selection methods in public procurement,” Journal of Purchasing and Supply Management, 73-83.

¹¹² Documentation of the new rules can be found at http://ec.europa.eu/growth/single-market/public-procurement/modernising-rules/reform-proposals/index_en.htm.

¹¹³ EurActiv (2014).

¹¹⁴ Ecorys (2009), “Non-Tariff Measures in EU-US Trade and Investment – An Economic Analysis.”

and other local content requirements. The EU has some rules that establish favoritism for European firms, e.g. in construction, as well as some domestic content requirements and a bureaucracy that is hard for outsiders to understand. On balance, the study found that removal of all public procurement barriers to trade would provide much greater benefits to European firms, due to the greater extent of American procurement rules.

In the 2009 survey, US construction companies identified public procurement rules as the most important non-tariff barrier to their expansion in Europe.¹¹⁵ Thus under TTIP, public procurement in Europe could be exposed to intensified competition from American construction firms.

More generally, obstacles could be raised to all the social and environmental objectives of public procurement. The WTO rule that only the product, not the process, matters, if extended to procurement, could undo all of the broader purposes of the recent EU procurement rules. Institutional changes such as ISDS could allow businesses to challenge the decisions of public agencies throughout Europe. ISDS rulings have forced South Africa to retreat on protection of historically disadvantaged groups, and have fined Mexico for a local government's refusal of a permit for a hazardous waste facility. Similar cases could undo much of the intentions and planning for public procurement in Europe, placing 18 percent of GDP under the control of international trade rules rather than democratic decisions about European priorities.

There is no comprehensive evaluation of the benefits of EU public procurement; it addresses numerous, extremely diverse social goals. It is possible to produce rough estimates of the social value of public employment, on the same basis as the evaluation of employment from renewable energy in Section 6. Since public procurement accounts for 18 percent of EU GDP, it seems reasonable to assume that it accounts for 18 percent of EU employment, or 39.2 million jobs as of 2014. Loss of even 1 percent of that employment from public procurement would represent a social loss of €2.2 – 2.9 billion per year; loss of 5 percent would represent a loss of €11 – 14 billion.¹¹⁶ Thus if TTIP leads to even a modest reduction in the European employment created by public procurement, it could impose losses of billions of euros per year.

8.2. Data Services and Privacy

Regulation of data services and protection of privacy is another area in which Europe and America have adopted opposite approaches. In Europe, protection of personal data dates back at least to the 1950 European Convention on Human Rights, and takes its modern form in the 1995 European Directive on Data Protection. That directive prevents dissemination of data on an individual unless the individual grants unambiguous, specific consent for the proposed use of the data, and prohibits manipulative, secret collection of personal data. A revision of the 1995 directive, proposed in 2012 and headed for potential adoption in 2016, updates data protection for the Internet and social media age. The new proposal strengthens a wide range of data standards, including consent standards and transparency requirements, the so-called "right to be forgotten" (that is, the right to delete obsolete and unwanted data), the right of data portability (easing transfer of personal data from one service to another), and application of EU rules to all companies worldwide that sell products or collect data in Europe.¹¹⁷

In contrast, in the words of an American legal scholar reviewing the two systems,

¹¹⁵ Ecorys (2009), 186.

¹¹⁶ As in Section 6, this assumes an average annual salary of €30,000, and a social value of employment of 19.0 – 24.7 percent of labor earnings, based on Bartik (2015).

¹¹⁷ European Commission (2012), "Why do we need an EU data protection reform?", http://ec.europa.eu/justice/data-protection/document/review2012/factsheets/1_en.pdf.

The current U.S. consent-based privacy regime allows merchants, databanks and other electronic aggregators to decide on the data's future uses. Once individuals have divulged online details about their lives, they are often powerless to prevent its dissemination to others...¹¹⁸

US laws do address privacy in specific sectors such as medical information, educational records, and financial data. In addition, the Federal Trade Commission (FTC) has taken action against some of the most manipulative, unfair, or deceptive data practices.¹¹⁹ A proposal by the Obama administration to expand data privacy protection (though still falling far short of current and proposed EU standards) appears doomed to failure in the face of Congressional hostility.¹²⁰

In addition, the US Department of Commerce, in consultation with the European Commission, developed the US-EU Safe Harbor Framework. This framework, approved by the EU in 2000, allows US organizations to make an annual declaration that they are complying with a list of principles, roughly equivalent to the 1995 Directive on Data Protection. By making such a declaration, US companies can avoid interruptions in their operations in Europe; data can legally be transferred from the EU to organizations participating in the Safe Harbor framework.¹²¹ Safe Harbor largely allows US businesses and organizations to evaluate their own compliance with EU standards, although the FTC has brought charges against some companies for Safe Harbor violations.¹²²

Safe Harbor has been popular, with more than 4,000 organizations listed as complying in 2013.¹²³ But there have been strains on the framework in recent years, as the proposed revision to EU standards will require strengthening Safe Harbor provisions, while the Snowden revelations have heightened awareness of and concern about data protection.¹²⁴ There have been calls for temporary suspension and/or thorough revision and strengthening of the Safe Harbor program.¹²⁵

Harmonization of regulations in this area is difficult to imagine: it would require one side or the other to abandon its current approach. If EU standards are rolled back, or if Safe Harbor provisions are weakened, there will be increased opportunities for international monopolies to dominate Internet activity and online commerce, and reduced protection for privacy and personal data. And even maintaining current standards may not be enough to protect against foreign government agencies engaging in the extensive surveillance efforts described in the Snowden documents.

Very partial estimates of the value of regulation in this area might be derived by comparing the cost of fraud to consumers and businesses under the looser US standards vs. the stricter EU approach. There is, however, no way to assign a comprehensive monetary value to the wide range of benefits of regulation in this area. But there is something of great value at stake, which would be lost if EU data and privacy protections were rolled back in order to reduce "non-tariff barriers to trade".

118 Alexander Tsesis (2014), "The right to erasure: Privacy, data brokers and the indefinite retention of data," *Wake Forest Law Review* 49, 433-484; quote from 434.

119 Daniel J. Solove and Woodrow Hartzog (2014), "The FTC and the new common law of privacy", *Columbia Law Review* 114, 583-676.

120 Richard J. Peltz-Steele (2015), "The pond betwixt: Differences in the U.S.-EU data protection/safe harbor negotiation", *Journal of Internet Law* 19, 1-30.

121 US Department of Commerce (2013), "U.S.-EU Safe Harbor Overview", http://www.export.gov/safeharbor/eu/eg_main_018476.asp.

122 FTC (2014), "FTC approves final orders settling charges of U.S.-EU Safe Harbor violations against 14 companies", <https://www.ftc.gov/news-events/press-releases/2014/06/ftc-approves-final-orders-settling-charges-us-eu-safe-harbor>.

123 Tsesis (2014), 468.

124 Peltz-Steele (2015).

125 Privacy Tracker (2013), "US-EU Safe Harbor Under Pressure", <https://iapp.org/news/a/us-eu-safe-harbor-under-pressure/>.

8.3. Labor Rights and Working Time

The United States and Europe are far apart on labor rights, the role of unions, social services, and public welfare. If TTIP allowed intervention in these areas, forcing downward harmonization of standards, there could be immense damage to the well-being of European workers and communities.

Comparison of the full range of labor and social welfare policies in Europe and America is beyond the scope of this report; entire books have been written on the subject.¹²⁶ Table 8.1 compares the two systems on an important subset of labor policies, examining three areas of regulations that set limits on working time in the EU and the US: working time for all workers; parental leave; and working time for truck drivers.

In the EU, the Working Time Directive requires member states to guarantee a set of rights for all workers, including a work week limited to an average of 48 hours, including any overtime; paid annual leave of at least four weeks; a well-defined schedule of daily and weekly rest periods; and other provisions.¹²⁷ In the US, there is nothing comparable to the Working Time Directive. The Fair Labor Standards Act requires higher pay for overtime for a broad category of workers (roughly speaking, non-professional employees), but “does not limit the number of hours per day or per week that employees aged 16 years and older can be required to work,” in the words of a US Department of Labor website.¹²⁸ There is no maximum work week, no requirement for paid annual leave, and no minimum rest periods for the workforce as a whole.

The gap between European and American standards is narrower, but still visible, in the area of parental leave. The EU’s Framework Agreement on parental leave guarantees all workers four months of leave, for both parents, on the birth or adoption of a child.¹²⁹ In the US the Family and Medical Leave Act provides 12 weeks of leave, for both parents, on birth or adoption, or for caring for serious health problems in a worker’s immediate family. However, the US law excludes workers at firms with fewer than 50 employees, and also excludes those who have worked less than 1,250 hours (about seven months of full-time work) at their current place of employment.¹³⁰ Both systems guarantee the right to return to the same or an equivalent job. Moreover, many higher-income European countries, which are perhaps more economically comparable to the United States, provide parental leaves that are far more generous than the EU’s minimum standard.

Finally, the hours of work allowed for truck drivers is an area of detailed regulation in both Europe and America. As both systems have recognized, exhausted drivers are a hazard to themselves and others on the roads, so protecting workers in this case also protects public safety. European regulations are distinctly more protective, limiting driving time to 9 hours a day, 56 hours a week, and 90 hours every two weeks; America allows 11 hours a day and 70 hours every 8 days.¹³¹ EU truck drivers get a 45 minute break every 4.5 hours, while their US counterparts get a 30 minute break after 8 hours behind the wheel.

¹²⁶ Among many others, see Gosta Esping-Andersen, editor (1996), *Welfare States in Transition: National Adaptations in Global Economies* (London: Sage Publications).

¹²⁷ <http://ec.europa.eu/social/main.jsp?catId=706&langId=en&intPageId=205>.

¹²⁸ <http://www.dol.gov/elaws/faq/esa/flsa/013.htm>.

¹²⁹ <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:em0031>.

¹³⁰ <http://www.dol.gov/whd/fmla/>.

¹³¹ http://ec.europa.eu/transport/modes/road/social_provisions/driving_time/index_en.htm; <https://www.fmcsa.dot.gov/regulations/hours-of-service>.

	UE	US
Working time limits: all workers	<p>Weekly work limited to average of 48 hours, including any overtime.</p> <p>Paid annual leave of at least 4 weeks.</p> <p>Minimum rest periods:</p> <ul style="list-style-type: none"> 24 consecutive hours every week 11 consecutive hours in every 24 A rest break during work if on duty for more than six hours 	<p>Non-professional employees receive 150% of normal hourly pay for work in excess of 40 hours per week.</p> <p><i>No other working time limits for all workers.</i></p>
Parental leave	<p>Four months of leave on birth or adoption of child, for all workers.</p>	<p>12 weeks of leave on birth or adoption of child, or serious medical problem in immediate family.</p> <p>Available to workers in public sector agencies, and firms with more than 50 employees, after working 1,250 hours.</p>
Working time limits: truck drivers	<p>Daily driving limited to 9 hours; may extend to 10 hours twice a week.</p> <p>Limit of 56 hours per week, and 90 hours per fortnight (two weeks).</p> <p>Daily rest of 11 hours, can be 9 hours 3 times a week.</p> <p>Weekly rest of 45 consecutive hours, can be 24 hours every second week.</p> <p>Breaks of 45 minutes after 4.5 hours driving.</p>	<p>Daily driving limited to 11 hours; daily work limited to 14 hours.¹³²</p> <p>Limit of 70 hours every 8 days.</p> <p>Daily rest of 10 hours.</p> <p>Weekly rest of 34 consecutive hours, including two periods of 1:00 – 5:00 AM.</p> <p>Breaks of 30 minutes after 8 hours driving.</p>

Table 8-1. Selected labor laws: EU - US comparison

Sources: European Commission and US government websites (see text and footnotes).

The American overreliance on cost-benefit analysis has played an unfortunate role in the standards for truck drivers. The agency that proposed the regulations, the Federal Motor Carrier Safety Administration (FMCSA), favored a 10-hour daily limit on driving, and even explored a 9-hour limit. However, cost-benefit analysis did not show a clear benefit from reducing the limit to 10 hours, so the agency concluded that it had to endorse the 11-hour limit. FMCSA found that a 10-hour limit might

¹³² The additional 3 hours may include loading and unloading, refueling, and other non-driving tasks.

save more lives and prevent more crashes, but would also increase costs. Although it is well known that crash risk increases with work hours, FMCA concluded that the available data "are not sufficiently robust to yield a statistically significant distinction between the crash risk associated with any two adjacent hours of work."¹³³

The principal change currently being considered in US trucking regulations is an increase in allowable hours, combined with other rollbacks of truck safety. Responding to lobbying by the trucking industry, Congress is pushing to allow 82 hours of driving per week, as well as longer and heavier trucks, and younger drivers (starting at age 18 instead of 21 for interstate trucking).¹³⁴ Deregulation, rather than worker health or public safety, is the focus of debate in Washington today.

Harmonization to American standards in labor rights and social welfare would be an immense loss to Europe, although it is difficult to put a monetary value on the benefits of regulation in these areas. In the area of truck safety alone, the US had 3,964 fatalities in crashes involving trucks in 2013; the annual cost of truck and bus crashes in America is estimated to be \$99 billion.¹³⁵ Some – it is hard to say exactly how much – of this human and economic cost is avoided by stricter regulation in Europe.

133 See the presentation of the final rule in the Federal Register at <http://www.gpo.gov/fdsys/pkg/FR-2011-12-27/pdf/2011-32696.pdf>; quote is from p. 81135.

134 Howard Abramson (2015), "The trucks are killing us", New York Times, August 21.

135 Abramson (2015).

9. THE GAINS FROM TTIP: POSITIVE OR NEGATIVE?

The many dimensions of regulatory benefits, as seen in the previous sections, are invisible in most studies of the economic impacts of TTIP. Risk management for toxic chemical use, mitigation of climate change, protection of food safety and animal welfare, data privacy, support for local communities and labor and social standards – all of this could be at risk under TTIP, yet all of this is missing in the standard economic assessments. Instead, regulations are seen as non-tariff barriers to trade, which have to be rolled back in order to achieve, according to one widely cited estimate, an annual gain of €68 - 119 billion for the European economy.

Even that modest amount of economic growth is uncertain. It is based on global trade models, almost all of which rely on the assumption of permanent full employment. Workers who lose their jobs to trade liberalization are assumed to find new jobs in growing sectors of the economy. The replacement jobs may pay different wages, may be located in different regions, or may require different skills, but, in these models, there is never any involuntary unemployment. This unrealistic assumption is mathematically convenient, and has become familiar to economic modelers – but it renders the models unable to determine whether a country or region will gain or lose jobs from a trade agreement. By assumption, employment is projected to be unchanged; this is an input to the models, not an output from them. Extensive critiques have shown that unrealistic assumptions such as full employment are crucial to standard trade models; tweaking these assumptions can reverse a model's main findings.¹³⁶

One major assessment of TTIP takes a different approach to the question of unemployment. Jeronim Capaldo, a researcher who is now at the International Labor Organization, used the United Nations Global Policy Model (GPM) to analyze the expected effects of TTIP on the economies of Europe, America, and the rest of the world.¹³⁷ Unlike the trade models used by CEPR and others, GPM assumes that economic activity and employment depend on the level of aggregate demand (i.e., total spending by households, businesses and governments, plus net exports).

In Capaldo's analysis, using the same patterns of expansion of US-EU trade under TTIP as in other models, there would be a gain of 784,000 jobs in the US and a loss of 583,000 jobs in the EU. TTIP would speed up GDP growth in the US and slow it down throughout the EU. Most of the European job losses and the greatest slowdown in growth would occur in France, Germany and other countries of northern Europe. But, according to Capaldo, every part of the EU would lose jobs and experience slower growth as a result of TTIP. Although TTIP would expand European exports to the US, it would, in this analysis, lead to a reduction in net exports as a percentage of GDP for all of Europe. Declines in intra-European trade and in Europe's trade with the rest of the world, combined with increased imports from the US, would outweigh the benefits of greater exports to the US.

An impassioned critique of Capaldo's work insists that he has used methods that virtually all economists would reject, and suggests that there are several technical defects in his model.¹³⁸ Capaldo's response addresses and disputes the claims of technical defects, argues that the full employment assumption of other models is unrealistic, and poses the underlying choice between modeling approaches: in analysis of the impacts of TTIP on Europe,

¹³⁶ Lance Taylor and Rudi von Arnim (2006), "Modeling the impact of trade liberalisation: A critique of computable general equilibrium models," Oxfam International Research Report; Ackerman and Gallagher (2008); Werner Raza et al. (2014), "AS-SESS_TTIP: Assessing the Claimed Benefits of the Transatlantic Trade and Investment Partnership," Austrian Foundation for Development Research (ÖFSE).

¹³⁷ Jeronim Capaldo (2014), "The Trans-Atlantic Trade and Investment Partnership: European Disintegration, Unemployment and Instability," Global Development and Environment Institute Working Paper 14-03, Tufts University.

¹³⁸ Matthias Bauser and Fredrik Erixon (2015), "'Splendid Isolation' as Trade Policy: Mercantilism and Crude Keynesianism in 'the Capaldo Study' of TTIP", ECPIE.

...projections with full-employment models suggest net economic benefits while a demand-driven model projects net losses. It is up to policymakers to take one view or the other based on how sensible the respective underlying assumptions appear.¹³⁹

In short, even in a narrowly economic assessment, focusing on income and employment impacts rather than the broader range of regulatory benefits, TTIP is only a bargain for Europe under specific, debatable assumptions. Under different assumptions, the EU would be worse off with TTIP, even by the narrowest economic criteria.

In addition, by requiring or encouraging regulatory harmonization, TTIP would put many benefits of European regulations at risk. The purposes of regulations – protection of human health and the natural environment, maintenance of social and labor standards, creation of strong and sustainable communities, stabilization of the earth's climate – are well worth pursuing, today as much as in the past. Why risk losing these greater goods in the pursuit of the small and uncertain gains projected by some but not all economic models?

¹³⁹ Jeronim Capaldo (2015), "Overcooked Free-Trade Dogmas in the Debate on TTIP", Global Development and Environment Institute, Tufts University.

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