8. Sustainability certification

As a renewable energy source, woodfuels can be carbon neutral, but assuring their sustainability requires careful socio-economic and environmental management along the entire supply chain. The aim of sustainable forest management is to ensure the long-term availability of forest resources while also maintaining ecosystem services such as soil and watershed protection; it encompasses the administrative, legal, technical, economic, social and environmental aspects of the conservation and use of forests. Sustainable forest management implies various degrees of deliberate human intervention, ranging from actions aimed at safeguarding and maintaining a forest ecosystem and its functions, to those favouring specific socially or economically valuable species or groups of species for the improved production of goods and services.

Interest in the international bioenergy trade has grown quickly in the last decade. The fastest growth has been primarily in woodchips and pellets – mostly from forest-sector and agricultural residues – traded at the national, regional and global levels. Bioenergy has traditionally been produced and consumed locally and thus its international trade is a recent phenomenon; given its potentially large scale, however, the sustainability of production is increasingly of international concern.

Environmental criteria for bioenergy production have been devised both for agricultural crops (e.g. the Roundtable for Sustainable Palm Oil) and forest-based systems (e.g. the Forest Stewardship Council and the Rainforest Alliance). They include:

- biodiversity (including genetically modified organisms) and natural ecosystems;
- water (efficient use and conservation, and pollution);
- soil conservation;
- crop management (e.g. the use of fertilizers and pesticides);
- waste management.

A number of schemes exist for the certification of forest management; they have broadly similar criteria and standards. The Rainforest Alliance, for example, is a certification body accredited by the Forest Stewardship Council; its Smartwood scheme has generic standards for assessing forest management and general standards for any type of crop management (Rainforest Alliance, 2007). The Forest Stewardship Council standards have been adapted to accommodate national and regional differences (Forest Stewardship Council, 2006a, 2006b). There are Forest Stewardship Council-accredited national initiatives in Brazil, Burkina Faso, Cameroon, Canada, China, Côte d'Ivoire, Hungary, Japan, Poland, Romania, the Russian Federation, Slovakia, South Africa, Zambia, and most

Western European countries. There are also a range of other standards, such as the chain-of-custody standard (FSC-STD-40-004).

Conservation International has developed a standards system for land-based projects that can deliver climate, biodiversity and community benefits, probably the most comprehensive of all standards related to the use of biomass (including for energy). The system describes quantitative and qualitative indicators and the ways of measuring them; in particular it addresses carbon stocks, which are not well covered by other certification and standards systems. The system has been tested in Asia, Africa, Europe and the Americas (CCBA, 2005).

An International Organization for Standardization (ISO) system is yet to be established for biomass, biofuels and energy, although there are standards for agriculture and forestry that may well be applicable. Life-cycle assessment is a way of quantifying the total environmental impact of a feedstock from production to final disposal. ISO 14040 describes an approach to life-cycle assessment based on an energy analysis framework (ISO, 2006). ISO has also developed a standard, ISO 14064, for greenhouse gas accounting and verification with the aim of providing governments and industry with an integrated set of tools for programmes aimed at reducing greenhouse gas emissions, as well as for emission trading. With the increasing market demand for biomass for biofuels and bioenergy production, a certification system is clearly needed. The World Wide Fund for Nature (2006) has called for an eco-certification system for biofuels in Europe, not only for those produced internally but also for those imported.

In Europe, the pan-European forest criteria and indicators for sustainable forest management have been in use since 1995; some of the indicators are of a qualitative nature and others are quantitative.

Other forest certification systems used in Europe which consider biomass production are those of the Forest Stewardship Council and the Green Gold Label (Junginger, 2006). The latter has three sections: a general standard; a forest standard; and an agricultural standard. All apply to agricultural or forest biomass and products and related industries. The main value of the general standard is the inclusion of a chain of custody for products involving transport, quality control and administration. The indicators in the Green Gold Label are similar to those of the ISO 9000 series, which reviews the administrative process. Forest management criteria require verifiable information, but they are mainly descriptive and fail to provide clear instructions on measurement.

The ten principles of the Forest Stewardship Council are as follows:

1. Compliance with laws and Forest Stewardship Council principles;
2. Tenure and use rights and responsibilities;
3. Indigenous peoples' rights;
4. Community relations and workers' rights;
5. Benefits from the forest;
6. Environmental impact;
7. Management plan;
8. Monitoring and assessment;

9. Maintenance of high-conservation-value forests;
10. Plantations.

The Forest Stewardship Council principles could be applied to all types of feedstock. Principle 1 (on legal compliance), for example, refers to the laws of the country or region, international treaties, and the Forest Stewardship Council's own principles. It encompasses international agreements related to biodiversity (such as the Convention on the International Trade in Endangered Species of Wild Fauna and Flora and the Convention on Biological Diversity), as well as those related to social issues, such as the International Labour Organization.

In many ways the most contentious principle is Principle 2 on tenure rights; it specifies that "clear evidence of long-term forest use rights to the land (e.g. land title, customary rights, or lease agreements) shall be demonstrated" (Forest Stewardship Council, 1996). In many developing countries, this is problematic; nevertheless, it is not an insurmountable problem, as suggested by the significant area of forest certified by the Forest Stewardship Council in developing countries (Table 39).

There is a risk that the use of a single system of certification could become simply a bureaucratic procedure involving the filling in of a form rather than a process to properly verify the sustainability of the management and use of resources (including waste) for energy production. A system like that proposed by the United Kingdom's Low Carbon Vehicle Partnership, which would involve a meta-standard, may be preferable. A meta-standard would work through a cross-compliance framework involving the development of "supplementary checks" to address gaps in existing schemes (ECCM, 2006).

Forest certification schemes that have generic standards for assessing forest management may also be applicable to woodfuels and other biofuels. For example, importing countries are now demanding assurances of the sustainability of imported biofuels across the production chain; this could have a major impact on the development of bioenergy markets. There are developments in forest certification that take into account aspects such as the reduction of greenhouse gas emissions, the preservation of biodiversity, non-competition with food supply, and ensuring the social and economic wellbeing of workers (e.g. ensuring the essential rights of workers, health benefits, and minimum wages). There is no "perfect fuel"; thus, some requirements may be complicated to implement in practice.

As a consequence of the Renewables Energy Directive (European Commission, 2009), sustainability standards are being considered for solid biomass to match those for liquid biofuels. Nevertheless, currently there is no date for the publication of standards for solid biomass. The European Committee for Standardization (CEN) T383 group continues to develop a sustainability CEN standard for Europe and is considering one for solid biomass.

In many cases, international forest certification systems such as the Programme for the Endorsement of Forest Certification and the Forest Stewardship Council could be applied to woodfuel production. These schemes contain environmental and socio-economic criteria and indicators that can be used to monitor and assess

TABLE 39
Certified forest area, 2000 (all schemes) and 2010 (FSC only) ('000 ha)

Region	2000 (all schemes)	2010 (FSC only)
Asia (excluding Near East)	158	3 247
Latin America and Caribbean	1 978	10 394
Europe	46 703	54 705
North America	30 489	48 876
Oceania	410	1 500
Africa	974	6 777
Annex I	77 562	102 200
Non-Annex I	3 155	23 248
World	**80 717**	**125 448**

Source: World Resources Institute, 2008; Forest Stewardship Council, 2010.

various aspects of the production chain as well as institutional issues such as the effectiveness of legislation and guidelines overseeing woodfuel production. They focus primarily on forests managed for timber production, although some of these practices clearly will have spin-off impacts that affect sustainability when bioenergy is also a major priority.

Table 39 provides information on forests certified under all schemes in 2000 and for FSC only as of March 2010. Certifications by ISO 14001 are not included because they are not designed specifically to assess whether sustainable forest management is being applied. Other certification bodies include the American Tree Farm Program, the Canadian Standards Association, Green Tag, and the Sustainable Forest Initiative of the American Forest and Paper Association. The area of certified forests increased considerably between 2000 and 2010, although it remains overwhelming concentrated in Europe and North America. As of March 2010, the area certified by the Forest Stewardship Council alone represented a 50 percent increase over all types of certification in 2000.