KOMISIA EURÓPSKYCH SPOLOČENSTIEV

Brusel 26.5.2004
KOM(2004) 366 konečná verzia

OZNÁMENIE KOMISIE RADE A EURÓPSKEMU PARLAMENTU

Podiel obnoviteľnej energie v EÚ

Správa Komisie v súlade s článkom 3 smernice 2001/77/ES, vyhodnotenie účinku legislatívnych nástrojov a ostatných politík Spoločenstva na rozvoj príspevku zdrojov obnoviteľnej energie v EÚ a návrhy konkrétnych opatrení

{SEC(2004) 547}

OBSAH

Zhrnutie

1. Ako sa uvádza v Zelenej knihe o bezpečnosti dodávok energie (2000), kľúčovými prioritami energetickej politiky Európskej únie je zaoberať sa rastúcou závislosťou Únie od dovozov energie z niekoľkých oblastí na svete a vyrovnať sa s klimatickými zmenami. Hľadiac dopredu, na najbližších dvadsať až tridsať rokov, Zelená kniha upozornila na štrukturálne nedostatky a na geopolitické, sociálne a environmentálne nedostatky dodávok energií do EÚ, najmä pokiaľ ide o európske záväzky v rámci protokolu z Kjóto.

   Podporovanie obnoviteľných energií zohráva dôležitú úlohu v obidvoch týchto úlohách. Únia od roku 1997 smerovala k ambicióznemu cieľu, dosiahnuť do roku 2010 12%-ný podiel obnoviteľných energií na hrubej domácej spotrebe. V roku 1997 podiel obnoviteľných energií predstavoval 5,4 %, v roku 2001 dosiahol 6 %.

2. Toto oznámenie posudzuje stav rozvoja obnoviteľných energií v Európskej únii. Slúži trom účelom:

   - Formálna správa, ktorú je Komisia povinná vypracovať v súlade s článkom 3 smernice 2001/77/ES a ktorá hodnotí pokrok dosiahnutý EÚ 15 v oblasti splnenia národných cieľov na rok 2010, pokiaľ ide o **elektrickú energiu z obnoviteľných zdrojov energie;**

   - Posúdenie prognóz dosiahnutia cieľa 12%-ného podielu obnoviteľnej energie na **celkovej spotrebe energií** v EÚ 15 v roku 2010 (vrátane vykurovania, elektrickej energie a dopravy), berúc do úvahy právne predpisy EÚ od roku 2000 a ostatné opatrenia v oblasti obnoviteľnej energie a energetickej účinnosti;

   - Návrhy **konkrétnych opatrení** na národnej úrovni a úrovni Spoločenstva s cieľom zabezpečiť dosiahnutie cieľov EÚ v oblasti obnoviteľnej energie na rok 2010 v kontexte s Bonnskou celosvetovou konferenciou o obnoviteľnej energii (jún 2004) a na základe uvedeného odhadnúť výhľad na rok 2020.

3. V súlade so smernicou 2001/77/ES všetky členské štáty prijali národné ciele pre podiel **výroby elektrickej energie z obnoviteľných zdrojov energie.** Väčšinou sú v súlade s referenčnými hodnotami uvedenými v prílohe I k tejto smernici.

   Ak členské štáty prijmú opatrenia potrebné na dosiahnutie svojich národných cieľov, podiel elektrickej energie z obnoviteľných zdrojov energie na výrobe elektrickej energie v EÚ 15 by sa mal blížiť podielu 22 %, ktorý stanovuje ako cieľ smernice.

   Analýza správ o pokroku, ktorú členské štáty predložili Komisii, však poukazujú na to, že politiky a opatrenia platné v súčasnosti s najväčšou pravdepodobnosťou dosiahnu podiel iba na úrovni 18 – 19 % v roku 2010 v porovnaní so 14 % v roku 2000.

   Jedným z dôvodov tohto rozporu je skutočnosť, že určitý počet členských štátov ešte nezaviedol aktívnu politiku v súlade s cieľmi, ktoré prijali.

Komisia bude pozorne sledovať situáciu v týchto členských štátoch, ako aj úplné uplatňovanie všetkých požiadaviek tejto smernice s cieľom pripraviť ďalšie kroky v neskoršej etape.

4. Komisia od roku 2000 navrhla značný počet nových **právnych nástrojov na podporu obnoviteľnej energie a energetickej účinnosti.** Európsky parlament a Rada väčšinu z nich prijali. Zvyšná časť sa nachádza v pokročilom štádiu medziinštitucionálneho procesu.

Prijali sa tieto návrhy:

- Smernica 2001/77/ES o podpore elektrickej energie vyrábanej z obnoviteľných zdrojov energie (Ú. v. ES L 283/33, 27.10.2001)

- Smernica 2003/30/ES o podpore používania biopalív (Ú. v. EÚ L 123/42, 17.5.2003)

- Smernica 2002/91/ES o energetickej hospodárnosti budov (Ú. v. ES L1/65, 4.1.2003)

- Smernica 2004/8/ES o podpore kogenerácie (Ú. v. EÚ L 52/50, 21.2.2004)

- Smernica 2003/96/ES o zdaňovaní energetických výrokov a elektriny (Ú. v. EÚ 283/51, 31.10.2003)

- Smernica 2000/55/ES o požiadavkách na energetickú účinnosť predradníkov pre žiarivkové osvetlenie (Ú. v. ES L 279/33, 1.11.2000)

- Smernica Komisie 2002/40/ES o označovaní elektrických rúr pre domácnosti (Ú. v. ES L 128/45, 15.5.2002)

- Smernica Komisie 2002/31/ES o označovaní klimatizačných zariadení (Ú. v. EÚ L 86/26, 3.04.2003)

- Smernica Komisie 2003/66/ES o označovaní chladničiek (Ú. v. EÚ L 170/10, 9.7.2003)

- Nariadenie 2422/2001/ES o programe označovania energetickej účinnosti kancelárskych zariadení (Ú. v. ES L 332/1, 15.12.2001)

Európsky Parlament a Rada skúmajú tieto návrhy:

- KOM (2003)453 z 1.08.2003 o eko konštrukčných požiadavkách výrobkov využívajúcich energiu

- KOM(2003)739 z 10.12.2003 o energetickej účinnosti a energetických službách

5. Komisia taktiež predložila návrh viacročného programu Inteligentná energia - Európa (EIE), ktorá je založená na úspechoch predchádzajúcich podporných programov Spoločenstva (ALTENER, SAVE a RTD). Európsky parlament a Rada prijali návrh v júni 2003 s rozpočtom 250 miliónov eur.

6. Vzhľadom na opatrenia, ktoré sa realizovali, Komisia odhaduje, že **podiel obnoviteľných energetických zdrojov v EÚ 15 smeruje k dosiahnutiu 10 % v roku 2010.** Tento schodok v porovnaní s 12%-ným cieľom je spôsobený pomalým rastom trhov s obnoviteľnými energiami na vykurovanie a chladenie, čo vedie k záveru, že tento sektor si vyžaduje značnú aktivitu, ak sa má umožniť dosiahnutie 12%-ného cieľa.

Toto posúdenie však predpokladá úplnú realizáciu požiadaviek právnych predpisov EÚ národnými a miestnymi orgánmi. Príklad smernice 2001/77/ES potvrdzuje, že tento fakt nemožno považovať za samozrejmosť. Ak sa na základe tejto smernice dosiahne iba 18 – 19 % podiel obnoviteľnej energie na trhu s elektrickou energiou v roku 2010, tak podiel obnoviteľnej energie na spotrebe energie ako celku nedosiahne viac ako 9 %.

V rámci platných právnych predpisov Spoločenstva sú to členské štáty, na ktorých spočíva zodpovednosť na zabezpečenie dosiahnutia dohodnutých cieľov a opatrení v skutočnosti realizované na uvedenom základeBude si to vyžadovať široký rozsah národných postupov vrátane úsilia zabezpečiť, aby zavedené firmy v odvetviach dodávky energií zaplatili určitý podiel nákladov spojených s podporou obnoviteľnej energie.

Oznámenie taktiež informuje o určitých konkrétnych doplnkových činnostiach na úrovni Spoločenstva s cieľom podporiť úsilie členských štátov dosiahnuť 12 % podiel EÚ 15.

7. Svetová konferencia o obnoviteľnej energii, ktorá sa má konať v Bonne v júni 2004, sa bude zaoberať podporou obnoviteľnej energie na celej zemi, ako prostriedku na boj proti klimatickým zmenám, podporovaním bezpečnosti energetických dodávok a najmä, v prípade rozvojových krajín, zmiernenie chudoby.

Európska prípravná konferencia, ktorá sa konala v Berlíne v januári 2004, dokazuje, že uplatňovanie celkových, všeobecných cieľov pre oblasť obnoviteľnej energie by mala byť predĺžená aj po roku 2010. Upozornila na celý rad technických štúdií, ktoré navrhujú ako cieľ minimálne 20 % obnoviteľnej energie z celkovej spotreby energie EÚ 25 v roku 2020, s použitím nástrojov stanovených v súčasných právnych predpisoch Spoločenstva a doplnkových činností na dosiahnutie výsledkov.

Komisia sa zaviazala prispieť k úspešnému výsledku tejto konferencie a zdôraznila značný počet činností, ktoré ponúkne ako vstup do Medzinárodného akčného programu.

1. ÚVOD

1.1. Globálne výzvy

Ako sa uvádza Zelenej knihe o bezpečnosti dodávok energie (2000), kľúčovými prioritami energetickej politiky Európskej únie je zaoberať sa rastúcou závislosťou Únie od dovozov energie z niekoľkých oblastí na svete a vyrovnať sa s klimatickými zmenami. Hľadiac dopredu, na najbližších dvadsať až tridsať rokov, Zelená kniha upozornila na štrukturálne nedostatky a na geopolitické, sociálne a environmentálne nedostatky dodávok energií do EÚ, najmä pokiaľ ide o európske záväzky v rámci protokolu z Kjóto.

Podporovanie obnoviteľných energií zohráva dôležitú úlohu v obidvoch týchto úlohách. Od roku 1997 Únia smerovala k ambicióznemu cieľu, dosiahnuť do roku 2010 12%-ný podiel obnoviteľných energií na hrubej domácej spotrebe. V roku 1997 v EÚ 15. podiel obnoviteľných energií predstavoval 5,4 %; v roku 2001 dosiahol 6 % (na porovnanie, ropa prispieva 40 %, zemný plyn 23 %, jadrová energia 16 % a tuhé palivá 15 %).

Okrem toho, obnoviteľné energie prispievajú k zlepšeniu kvality ovzdušia, k inovančnej schopnosti, k vytváraniu nového podnikania, zamestnanosti a rozvoja vidieka, v kontexte upevňovania 3 pilierov trvalo udržateľného rozvoja.

Na globálnej úrovni spotreba energie rastie rýchlo – o 15 % počas dekády 1990 - 2000. Očakáva sa, že medzi rokmi 2000 a 2020 bude rásť dokonca ešte rýchlejšie.

Na fosílne palivá (uhlie, plyn a ropa) pripadá približne 80 % celosvetovej spotreby energie. Globálna spotreba fosílnych palív rástla v deväťdesiatych rokoch 20. storočia v súlade s celkovou spotrebou energie. Očakáva sa, že využívanie fosílnych palív bude rásť dokonca ešte rýchlejšie ako celková spotreba v období do roku 2020.

Fosílne palivá ponúkajú mnohé výhody. Ich ťažba je relatívne lacná, ich používanie je výhodné a sú široko dostupné. Infraštruktúra na ich dodávanie funguje. Odvetvia priemyslu, ktoré ich dodávajú, sú dobre organizované a ponúkajú dodávky vo väčšine častí sveta.

Majú dve hlavné nevýhody. Po prvé, keď sa spaľujú, emitujú polutanty a skleníkové plyny, ktoré spôsobujú klimatické zmeny. Za druhé, krajiny bez adekvátnych rezerv fosílnych palív – najmä ropa – čelia rastúcim rizikám, pokiaľ ide o bezpečnosť svojich energetických dodávok. Závislosť od dovozu a rastúce dovozné pomery môžu viesť k obavám, pokiaľ ide o riziko prerušenia dodávok alebo ťažkostí spojených s týmito dodávkami. Bezpečnosť dodávok sa však nesmie chápať iba ako otázka zníženia závislosti od dovozu a zvýšenia domácej výroby. Bezpečnosť dodávok si vyžaduje široký rozsah politických iniciatív zameraných, okrem iného, na diverzifikáciu zdrojov a technológií a bez ignorovania geopolitických súvislostí a ich dopadov.

Európska komisia stanovila svoje nápady o tom, ako sa vyrovnať s týmito problémami v Zelenej knihe o bezpečnosti energetických dodávok (2000)[1] a v oznámení o energetickej spolupráci s rozvojovými krajinami (2002)[2].

---

[1] „Smerom k Európskej stratégii pre bezpečnosť energetických dodávok", KOM (2000) 769.

[2] „Energetická spolupráca s rozvojovými krajinami", KOM (2002) 408.

Obnoviteľná energia ako náhrada za fosílne palivá môže pomôcť vyrovnať sa s klimatickými zmenami. Môže zlepšiť bezpečnosť dodávok zvýšením diverzifikácie výroby energie. Prípady takejto obnoviteľnej energie sú posilnené jej účinkami na ochranu kvality ovzdušia a na tvorbu nových miest a podnikania – mnohé z nich vo vidieckych oblastiach.

V súčasnosti investície do obnoviteľnej energie nepredstavujú vo všeobecnosti najlacnejší spôsob znižovania emisií skleníkových plynov. Lacnejšie je využívať energiu účinnejšie. Investície do obnoviteľnej energie sú však životne dôležité z hľadiska dlhodobej perspektívy. Skúsenosti v odvetviach, ako je veterná energia, potvrdili, že trvalé investície vedú k inováciám, ktoré ešte ďalej zlacňujú využívanie obnoviteľnej energie. Naopak, náklady na doplnkové opatrenia týkajúce sa energetickej účinnosti vzrastú po obratí „nízko visiaceho ovocia“. Investície sú potrebné do obidvoch opatrení.

1.2. Úloha Európy

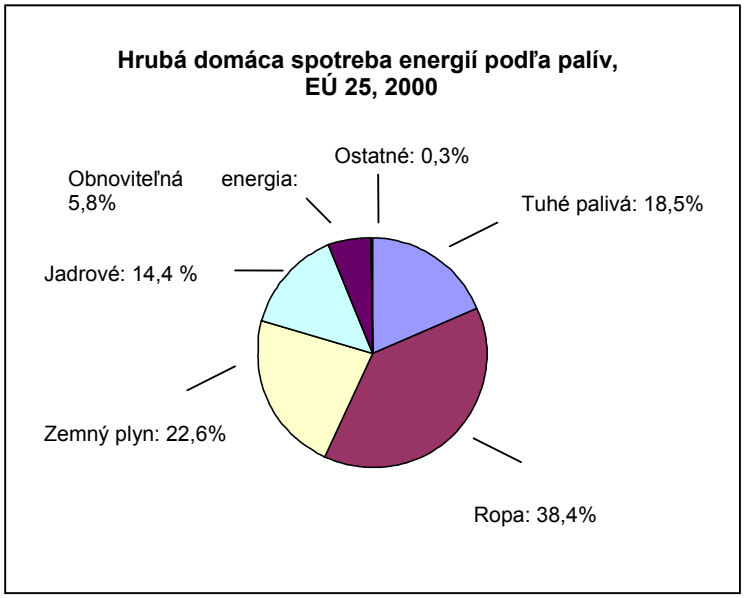
Od Európskej únie, už rozšírenej na 25 členov, sa očakáva, že na ňu pripadne iba 7 % nárastu v globálnej spotrebe energie medzi rokmi 2000 a 2020. Očakáva sa, že viac ako jedna tretina bude pochádzať z Číny a Indie. Rozhodnutia v týchto krajinách a v ostatných industrializujúcich sa krajinách budú mať zvyšujúci vplyv na úroveň a štruktúru celosvetovej spotreby energie.

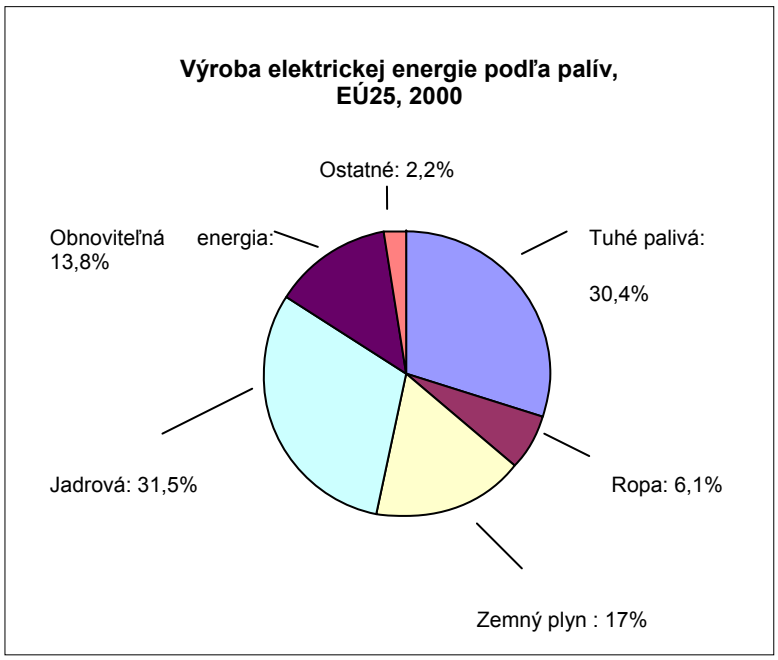
Európska únia a ostatné krajiny OECD musia zohrávať morálnu a praktickú úlohu pri umožňovaní industrializujúcim sa krajinám prijímať také politiky, ktoré pomôžu zabezpečiť ich energetické dodávky a udržať klimatické zmeny pod kontrolou bez ohrozenia ich ekonomického rastu.

Priemerný občan EÚ 25 spotrebuje približne päťkrát toľko fosílnej energie ako priemerný občan Ázie, Afriky a Stredného východu (to isté platí pre občanov japonsko-pacifického regiónu. Občania Spojených štátov spotrebujú takmer 12-krát toľko). Ak najbohatšie krajiny nebudú brzdiť svoju spotrebu fosílnych palív, tak majú malú perspektívu presvedčiť menej bohaté krajiny k takémuto konaniu, a to najmä vtedy, ak mnohým ľuďom v rozvojových krajinách chýbajú adekvátne energetické služby.

Európska únia vykonala špecificky praktický príspevok v oblasti obnoviteľnej energie, hlavne vypracovaním lepších a lacnejších technických a inštitucionálnych riešení. Európa je priekopníkom rozvoja a implementácie moderných techník obnoviteľnej energie. Na západnú Európu s jej 16 % celosvetovej spotreby energie, pripadlo 31 % z nárastu výroby elektrickej energie z biomasy v rokoch 1990 a 2000; 48 % z nárastu z malých vodných elektrární, a 79 % z nárastu z veternej energie. Európska únia a jej členské štáty boli priekopníkmi politických a regulačných dohovorov, ako sú ciele a finančné programy potrebné na poháňanie obnoviteľnej energie smerom dopredu. Európske spoločnosti zastávajú vo svete technológie obnoviteľnej energie vedúcu pozíciu.

Ak bude Európa naďalej zohrávať svoju úlohu, tak nesmie byť v tejto súvislosti samoľúba. Ako vyplýva z diagramov, príspevok v oblasti obnoviteľnej energie v Európe ešte stále zaostáva za príspevkami tuhých palív, ropy, zemného plynu a jadrovej energie.





Európska únia potrebuje cenovo dostupnú obnoviteľnú energiu, aby mohla prispieť k riešeniu svojich vlastných problémov s bezpečnosťou dodávok a splniť svoje ciele znižovania emisií skleníkových plynov. Uznávajúc rozsiahle výhody obnoviteľnej energie, Európa nalieha na rozvíjanie technologických a inštitucionálnych riešení, ktoré sa dajú taktiež použiť v globálnom meradle.

Zatiaľ čo obnoviteľná energia musí zohrávať významnú úlohu, je dôležité brať do úvahy určité ťažkosti.

Po prvé, existujú technické a praktické limity nákladovo-efektívnej dostupnosti obnoviteľnej energie. Existujú významné geografické variácie vo výskyte veternej a slnečnej energie.

Výroba biomasy musí konkurovať iným využívaniam pôdy, a to hlavne poľnohospodárstvu. Existuje obmedzenie v počte údolí, ktoré sa dajú využiť na vodné elektrárne. Pracovný

dokument útvarov Komisie, uverejnený súčasne s týmto oznámením, obsahuje dôkladnú analýzu potenciálu obnoviteľnej energie v každom členskom štáte. Podrobnejšia analýza je ohlásená tak ako bolo vyhlásené v tomto oznámení.

Po druhé, zdroje obnoviteľnej energie potrebujú konvenčné energetické zdroje ako záložné zdroje. Veterná a solárna energia je prerušovaná a nepredvídateľná. Klimatické faktory môžu spôsobovať z roka na rok veľké výkyvy v dostupnosti biomasy a hydroenergie. Z týchto dôvodov, existujú limity podielu obnoviteľnej energie, ktoré sú naše súčasné energetické rozvodné sústavy schopné absorbovať. Toto môže spôsobiť náhradnú nadbytočnú kapacitu tradičných zdrojov spojenú s určitými ďalšími nákladmi. Rozvoj obnoviteľnej energie si môže vyžiadať nové investície do existujúcich energetických sústav, ako sú elektrické rozvodné siete. Energetická politika potrebuje rozvoj širokého rozsahu rôznych energetických zdrojov – poučiac sa z potreby diverzifikácie, na tento fakt sa nesmie zabúdať.

Záverom, rozvoj diverzifikovanejšej a bezpečnejšej energetickej sústavy vrátane vyššieho podielu obnoviteľnej energie zostáva v dnešnej dobe, vo všeobecnosti, politikou vyšších nákladov. Je pravdou, že vodná energia a tradičné použitia dreva sú konkurencieschopné s konvenčnými formami energie, a že veterná energia sa približuje ku konkurencieschopnosti v niektorých pobrežných lokalitách s vysokými priemernými rýchlosťami vetra. V každom prípade, mnohé formy obnoviteľnej energie – napríklad elektrická energia z biomasy a biopalivá – stoja dva alebo viac krát toľko ako ich konvenčné alternatívy v porovnaní na jednotlivom základe bez posudzovania dopadu celkových nákladov na energetickú sústavu. Ostatné, ako je fotovoltaická energia, sú stále ešte drahšie[3].

Z tohto dôvodu pretrvávajú určité bariéry rozvoja obnoviteľných energií. Zatiaľ čo súčasný stav technologického rozvoja nedovoľuje predvídať svet, v ktorom budú konvenčné energetické zdroje úplne náhradné obnoviteľnou energiou, postupnejší prístup možno určite plánovať.

Zlepšené analytické a riadiace nástroje sa už postupne objavujú a musia umožniť správnu odpoveď na tieto výzvy a kľúčové bariéry. Zaraďujú sa sem prepracovanejšie kalkulačné modely, ktoré zohľadnia dopad zvýšených podielov obnoviteľnej energie na celkové náklady energetickej sústavy, prepracovanejšie nástroje na predpovedanie počasia môžu byť taktiež integrované do moderných systémov energetického riadenia s cieľom lepšie zosúladiť ponuku s dopytom. Ďalšia analýza sa preto musí vykonať v prijateľnom čase takým spôsobom, ako bude oznámené v tomto dokumente.

---

[3] „Veterná energia – fakty" (Európske združenie pre veternú energiu, 2004) udáva náklady na najvýhodnejšiu výrobu energie z vetra rádovo 4 až 5 €-centov za kWh. „Obnoviteľné zdroje na výrobu elektrickej energie" (Medzinárdoná energetická agentúra, 2003) udáva náklady pre fotovoltaickú energiu na úrovni najmenej 17 €-centov za kWh; a náklady elektrární na výrobu elektrickej energie z biomasy na úrovni 7 €-centov za kWh alebo viac. Náklady sa však dajú znížiť, ak sa biomasa bude používa v kombinovaných teplárňach a elektrárňach (na 5 až 6 €-centov za kWh) alebo na spoluspaľovanie s fosilnými palivami, kde sa dá zamedziť investičným nákladom na energetický cyklus (až na 2 - 4 €-centy za kWh). Napríklad, veľkoobchodné náklady na elektrickú energiu vyrábanú v konkurenčných elektrárňach predstavujú v súčasnosti 3 €-centy za kWh. Oznámenie Komisie o „Alternatívnych palivách pre cestnú dopravu a o súbore opatrení na podporu používania biopalív" (KOM (2001) 547) uvádza náklady rádovo 500 €/1000 litrov biopalív v porovnaní s 200 - 250 €/1000 litrov palív na báze ropy pri cene 30 USD /barrel.

1.3. Rozsah pôsobnosti tohto oznámenia

Od roku 1997 Únia pracovala na **celkovom cieli** zvýšiť na 12 % podiel obnoviteľnej energie na hrubej spotrebe domácej energie v EÚ 15 v roku 2010, v porovnaní s 5,2 % v roku 1995. Najväčším rizikom pre dosiahnutie tohto cieľa je nerovnováha medzi úrovňami rôznych krajín zaviazaním sa k rozvoju obnoviteľnej energie.

S cieľom zamerať sa na rýchlejší pokrok Európska únia stanovila od roku 2000, na základe právnych predpisov dva **indikatívne ciele** pre obnoviteľnú energiu:

- zvýšenie na 22 % podielu **elektrickej energie** získavanej z obnoviteľnej energie v roku 2010 pre EÚ 15 (v porovnaní so 14 % v roku 2000);[4]

- zvýšenie na 5,75% podielu biopalív na nafte a benzíne používanom **v doprave** v roku 2010 (v porovnaní s 0,6% v roku 2002).[5]

Komisia taktiež navrhla značný počet nových právnych nástrojov na podporu energetickej účinnosti. Európsky parlament a Rada schválili väčšinu týchto návrhov a zvyšné sa nachádzajú v pokročilom štádiu medziinštitucionálneho procesu.

Toto oznámenie slúži trom účelom:

- Formálna správa, ktorej vypracovanie zo strany Komisie vyžaduje článok 3 smernice 2001/77/ES, hodnotiaca pokrok, ktorý dosiahla EÚ 15 v oblasti dosiahnutia národných cieľov na rok 2010, pokiaľ ide o **elektrickú energiu z obnoviteľných zdrojov energie;**

- Posúdenie prognóz dosiahnutia cieľa 12%-ného podielu obnoviteľnej energie na **celkovej spotrebe energie** v EÚ 15 v roku 2010 (vrátane vykurovania, elektrickej energie a dopravy), berúc do úvahy právne predpisy EÚ od roku 2000 a ostatné opatrenia v oblasti obnoviteľnej energie a energetickej účinnosti;

- Návrhy **konkrétnych opatrení** na národnej a na úrovni Spoločenstva, s cieľom zabezpečiť dosiahnutie EÚ cieľov v oblasti obnoviteľnej energie pre rok 2010, v kontexte s Bonnskou celosvetovou konferenciou o obnoviteľnej energii (jún 2004) a prístup na prijatie scenára na rok 2020.

1.4. Nové členské štáty

Desať nových členských štátov EÚ podlieha podmienkam smernice 2001/77/ES o elektrickej energii z obnoviteľných energetických zdrojov. Národné indikatívne ciele pre podiel elektrickej energie z obnoviteľných zdrojov v každom novom členskom štáte je stanovený v zmluve o pristúpení. To znamená, že kolektívnym cieľom je, aby podiel obnoviteľnej energie v EÚ 25 dosiahol 21 % v roku 2010.

---

[4] Smernica 2001/77/ES o podpore elektrickej energie vyrábanej z obnoviteľných energetických zdrojov na domácom trhu.

[5] Smernica 2003/30/ES o podpore používania biioplaív a ostatných obnvoteľných palív pre dopravu tieto údaje zahŕňajú príspevok 10 pristupujúcich krajín. Údaj za EÚ 15 za rok 2000 predstavoval 0,7 %.

V prípade EÚ 15, smernica požaduje od Komisie schváliť prvú správu o pokroku počas roka 2004. Túto funkciu plní kapitola 2 tohto oznámenia. Z tohto dôvodu sa sústreďuje na EÚ 15. V prípade nových členských štátov prvá správa o pokroku na základe národných správ, ktoré musia vypracovať dané členské štáty je plánovaná až na rok 2006. Z tohto dôvodu sa ich pozícia v kapitole 2 neposudzuje. Táto kapitola však kvôli informovanosti uvádza niektoré príklady priaznivého rozvoja v oblasti výroby elektrickej energie z obnoviteľných energetických zdrojov v nových členských štátoch.

Nové členské štáty podliehajú požiadavkám smernice o biopalivách (2003/30/ES). Komisia vypracuje prvú správu o pokroku v rámci tejto smernice v roku 2006. Bude sa vzťahovať na všetkých 25 členských štátov.

Cieľ 12%-ného podielu obnoviteľnej energie na celkovej spotrebe energie je cieľom EÚ 15. Pokrok zaznamenaný k tomuto cieľu je posudzovaný v kapitole 3 tohto oznámenia. Podobne ako v kapitole 2, táto kapitola sa zameriava na členské štáty, ktorých sa tento cieľ týka. Na ilustráciu znovu uvádza jednotlivé príklady z nových členských štátov.

Kapitoly 4 a 5 sa zaoberajú budúcimi politikami a postupmi. Tie sa týkajú celej EÚ.

Pracovný dokument útvarov Komisie uverejnený súčasne s týmto oznámením sa týka všetkých členských štátov.

2. COMMISSION REPORT ON NATIONAL PROGRESS TOWARDS ELECTRICITY PRODUCED FROM RENEWABLE ENERGY SOURCES (RES-E) TARGETS

2.1. Information sources used

Under article 3.4 of Directive 2001/77/EC, the Commission is required to assess to what extent:

> *"- Member States have made progress towards achieving their national indicative targets,*
>
> *- the national indicative targets are consistent with the global indicative target of 12% of gross national energy consumption by 2010 and in particular with the 22.1% indicative share of electricity produced from renewable energy sources in total Community electricity consumption by 2010."*

According to Articles 3.2 and 3.3 of the Directive, Member States must adopt national reports setting their national targets and analysing their success in meeting them.

Reports on national targets were due in 2002. All EU15 Member States have adopted them.

Reports on progress towards national targets were due by October 2003. All Member States except Finland, Luxembourg and Italy have sent them to the Commission (see Commission Staff Working Document).

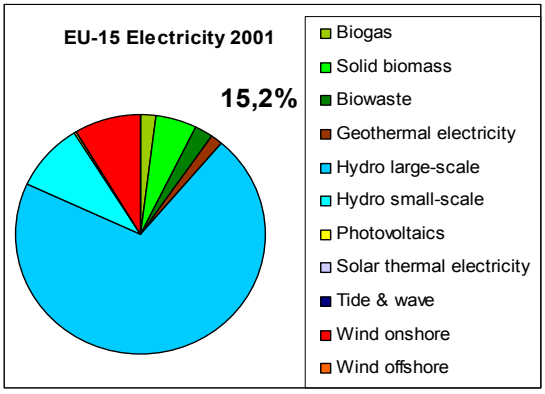
The Commission has analysed these reports and commissioned several consultancies to make assessments of the impact of the measures they describe (see Commission Staff Working Document).

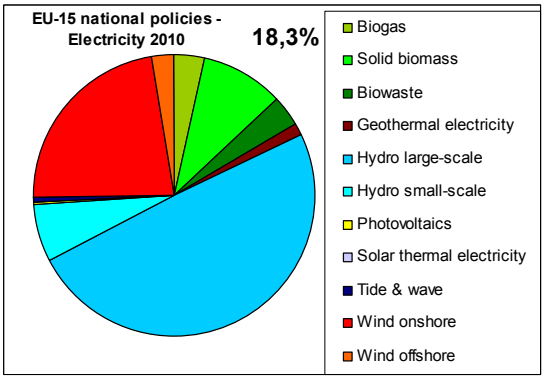
2.2. The overall picture

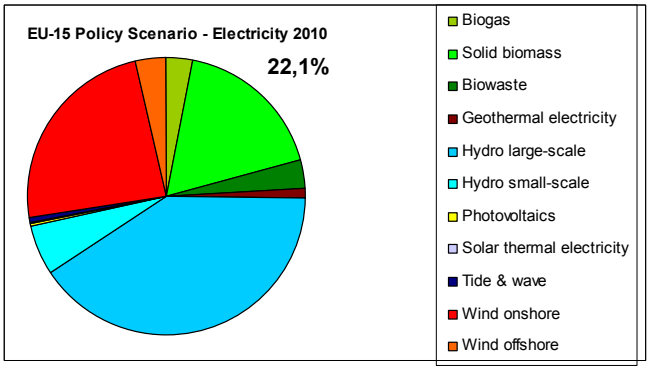
A first conclusion is that the target adopted by each Member State is consistent with the national reference value listed in Annex I of Directive 2001/77/EC, although Sweden has used a different method to fix a different value[6]. If Member States meet these national targets, the overall share of renewable electricity in the EU15 will achieve the target of about 22% in 2010, as required by the Directive.

Unfortunately, the national policies, measures and achievements reported by Member States paint a less rosy picture.

It should be underlined that it is difficult to predict exactly how measures now adopted will affect the share of electricity from renewable sources in 2010. However, the extrapolation scenarios set out in the Commission Staff Working Document lead to the **second conclusion** that, although progress towards meeting the targets has begun, the 2010 target will **not** be achieved under current policies and measures, even under a scenario that builds in reductions in total electricity demand as a result of new energy efficiency measures. Instead, currently implemented policies will probably result in a share of between 18% and 19% in 2010 (see charts).







A **third conclusion** is that the main reason why the target is not being achieved is because the production of electricity from biomass has not been as high as initially previewed. The main difference between 2nd chart (showing the effect of national policies and measures now in

6 Sweden has set a target for 2010 of an additional 10 TWh of electricity from renewable energy sources other than hydro, compared with 2002. The Swedish hydro figures are based on an average calculated on a 50 year base. This makes it difficult to convert the figures given by Sweden into a percentage.

place or recently planned) and 3rd chart (showing a practicable scenario for achieving the 22.1% target set in the Directive) is the size of the biomass (green area) contribution.

2.3. Assessment of progress at the national level

Country reports indicate considerable differences between Member States. Figure 1, based on the detailed information in Commission Staff Working Document, arranges Member States in three groups according to the probability that, with the energy policies currently adopted, they will achieve their national targets. The first group (Germany, Denmark, Spain, Finland) is on track. The countries in the second group (Austria, Belgium, Ireland, the Netherlands, Sweden, the United Kingdom, France) have started to implement appropriate policies. For this group there is a mixture of positive and negative indications regarding the achievement of the 2010 targets. The countries in the third group (Greece, Portugal) are not on track to achieve their national targets.

Italy and Luxembourg adopted new laws in March 2004. It has not yet been possible to assess their likely effects. However, only limited progress can be recorded for these two Member States during last 3 years. See Commission Staff Working Document for more details.

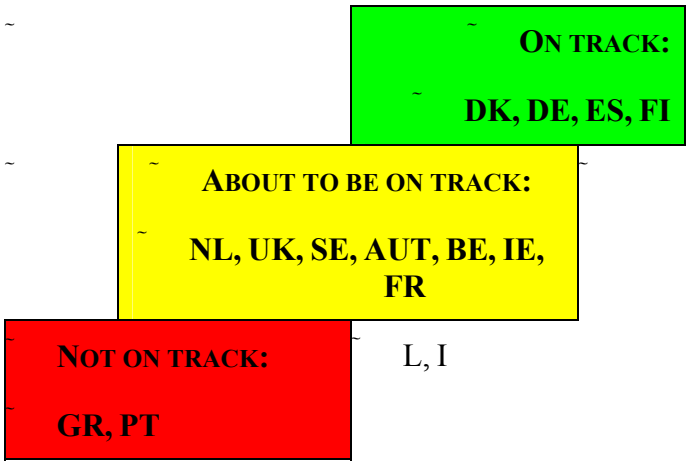


Figure 1: Member States' progress towards achieving their national indicative target by 2010

On track. Denmark, if it maintains its active approach, is likely to achieve the 2010 target (29%) as early as 2005. Denmark has increased the share of electricity from renewable sources from 8.9% in 1997 to 20% in 2002. Germany has increased the share from 4.5% in 1997 to 8% in 2002 (national target of 12.5%) with wind generation growing from 3 TWh in 1997 to 17 TWh in 2002 (equal to 3% of the total electricity consumption in 2002). Spain is the second European country for wind power although its biomass policy needs to be given higher priority.

According to Finland's national report, the contribution of electricity from renewable energy, passed from 7 TWh in 1997 to 10 TWh in 2002 excluding hydro. Although 2002 was a bad year for hydropower in Finland, the evolution of biomass has been impressive in the recent years.

One of the drivers of success in all four countries was an attractive support system in a stable and long-term framework.

About to be on track. For electricity from renewable energy, United Kingdom and Netherlands have actively invested in a new policy although the full results still have to

materialise. Ireland has set up a support system through tendering but there are big difficulties in connecting wind electricity to the grid. Since 2002, Belgium has a new green certificate system. For the moment this does not show visible results.

France recently put in place a new tariff system. The attractiveness of the tariffs is, however, reduced by the upper limit of 12 MW for each project. This particularly affects wind energy. In addition, long approval procedures and grid connection problems remain major obstacles.

Sweden implemented a green certificate system in May 2003. Electricity generation from renewable energy rose hardly at all in Sweden between 1997 and 2002. But signals from 2003 are much better.

Austria has a good perspective for growth. Such a development is facilitated by the feed-in tariffs introduced in January 2003, however not excluding a streamlining of the support scheme with additional efficiency requirements.

Not on track. So far, the development of electricity from renewable energy has been held back in Greece. Administrative barriers prevent exploitation of the high potential that exists both in wind, biomass and solar. Portugal has increased its non-hydro production of electricity from renewable energy by only 1 TWh since 1997. A further 14 TWh are still needed to achieve its national target.

2.4. Practical requirements laid down in Directive 2001/77/EC

In addition to the requirement for national indicative targets, the Directive lays down practical requirements for Member States in four areas. These are designed to ensure stable investment conditions for electricity from renewable energy:

1) the implementation of attractive support schemes, which should be as efficient as possible,

2) the removal of administrative barriers,

3) the guarantee of fair grid access,

4) the issuing of a guarantee of origin.

Most Member States have implemented a support system for renewable energy. These take the form of feed-in tariffs, quota obligations and/or green certificates.

National reports show that appropriate financial mechanisms are not enough. In several cases, take-off is blocked by complex licensing procedures, poor integration of electricity from renewable energy in regional and local planning and opaque grid-connection procedures. The table gives an overview of the situation in the Member States.

MEMBER STATE	ADMINISTRATIVE BARRIERS	GRID BARRIERS
AUSTRIA	☺	😐
BELGIUM	😐	😐
DENMARK	☺	☺
FINLAND	☺	☺
FRANCE	☹	☹
GERMANY	☺	☺
GREECE	☹	☹
IRELAND	☺	☹
ITALY	N.A.	N.A.
LUXEMBOURG	N.A.	N.A.
PORTUGAL	☹	☹
SPAIN	☺	☺
SWEDEN	☺	☺
THE NETHERLANDS	☹	☺
UNITED KINGDOM	😐	😐

☺ = GOOD CONDITIONS
😐 = MEDIUM CONDITIONS
☹ = INSUFFICIENT / STRONG BARRIERS
N.A. = INFORMATION NOT AVAILABLE

Table 1: Overview of Member States's administrative and grid barriers

In accordance with the Directive, the Commission will report in 2005 on support systems (Article 4.2) and best practices in administrative procedures (Article 6.3).

2.5. Guarantees of origin

Article 5 of the Directive requires Member States to implement a system for a guarantee of origin by 27 October 2003.

Implementation is in several stages. The most important of these are: implementing legislation, appointing the body for issuing the guarantees of origin and establishing an accurate and reliable system including the preparation of documents and registries.

Based on national reports and supplementary information, the situation in March 2004 is the following:

	LEGISLATION	ISSUING BODIES	"READY TO GO"
AUSTRIA		DSO	
BELGIUM, BR		OTHERS	
BELGIUM, FL		REGULATOR	
BELGIUM, W		REGULATOR	
DENMARK		TSO	
FINLAND		TSO	
FRANCE		OTHERS	
GERMANY		AUDITORS	
GREECE		DSO AND TSO	
IRELAND		REGULATOR	
ITALY		TSO	
LUXEMBOURG		REGULATOR	
PORTUGAL		TSO	
SPAIN		REGULATOR	
SWEDEN		TSO	
THE NETHERLANDS		TSO	
UK		REGULATOR	

	COMPLETED
	UNDER PREPARATION
	NOT IMPLEMENTED
D	DISTRIBUTION SYSTEM OPERATOR
T	TRANSMISSION SYSTEM OPERATOR

Full implementation – 3 "completed" boxes – means that a guarantee of origin can actually be issued. Although the table shows more green than red, implementation is not yet complete.

The Commission will consider the practical implementation of guarantees of origin in its report on support systems in 2005. It will look at the validity of guarantees and the need for

redemption, the reliability of the system, and the inclusion of guarantees of origin into the different support schemes, as appropriate.

In accordance with Article 5 of the Directive, the Commission will consider the desirability of proposing common rules for guarantees of origin.

2.6. Clarification of the role of the guarantee of origin in the calculation of progress towards national targets

In the Directive (Article 3), national targets are defined in terms of the consumption of renewable electricity from renewable energy sources as a percentage of total national electricity consumption. The consumption of electricity is defined as national production plus imports minus exports. In the Directive's Annex I, reference values for national targets are determined solely as percentages of national production.

The question that arises is under what conditions can a Member State consider that imported renewable electricity is contributing to the achievement of its target under the Directive.

A Member State cannot meet its targets with imports from outside the EU. This is made clear in a footnote to the table in the Annex I, which states that in *"…. the case of internal trade of RES-E (with recognised certification of origin registered) the calculation of these percentages will influence 2010 figures by Member States but not the Community total."*

However, the situation is not so clear regarding imports from within the EU.

The Commission acknowledges the need to clarify how progress towards national targets is to be calculated. In particular, it is important to define the role of guarantees of origin.

The Commission has decided to apply the following principle in assessing the extent to which national targets are met:

> *A Member State can only include a contribution from import from another Member State if the exporting state has accepted explicitly, and stated on a guarantee of origin, that it will not use the specified amount of renewable electricity to meet its own target and thereby also accepted that this electricity can be counted towards the importing Member State's target.*

It should be emphasised that trade in renewable electricity should occur. Consumer preferences may in any case generate trade. However, in the absence of the agreement of the exporting country, the production will be counted towards the target of this exporting country.

Exporting Member States could include this agreement directly in guarantees of origin for renewable electricity produced on their territory. If they do not do so, importing Member States could ask for a supplementary approval with reference to the guarantee of origin in question.

2.7. Infringement procedures

The Commission will examine the transposition of the binding text of Directive 2001/77/EC, in particular regarding the practical requirements described above. It will take into account the national report and will take infringement action where appropriate.

2.8. Development of electricity from wind, biomass and solar

In total, renewable energy accounts in 2002 for about 15.2% of total electricity generation. Nuclear energy accounts for 33%. Fossil fuel thermal processes account for the remainder.

The EU15 is using nearly all its large hydro potential. The contribution of this renewable energy source is high but the total capacity will remain stable. The two technologies that can be expected to deliver most of the increase in electricity from renewable sources in EU15 for 2010 are wind and biomass. However, in the new Member States – particularly in Slovenia, Hungary and Lithuania – there is still an important potential to increase hydro energy generation.

Output expectations from the different biomass uses need to be reassessed taking into account its efficiency and availability. Section 2.2 showed clear differences in their growth rates of both energy sources. In addition, for strategic reasons on a medium time horizon (towards 2020 and beyond), solar energy is also observed.

2.8.1. Wind energy

The European wind industry has 90% of the world equipment market. Nine of the world's ten largest wind turbine manufacturers are based in Europe. The industry employs 72,000 people, up from 25,000 in 1998. Costs per kWh have fallen by 50% over the last 15 years.

Installed capacity in the EU15 grew by 23% in 2003, to a total of more than 28 GW (Figure 2). In an average wind year this capacity can produce 60 TWh of electricity, approximately 2.4% of EU electricity consumption.

This success story is not the result of a common European effort. As the chart shows, Germany, Spain and Denmark contribute 84% of total EU15 wind power capacity.

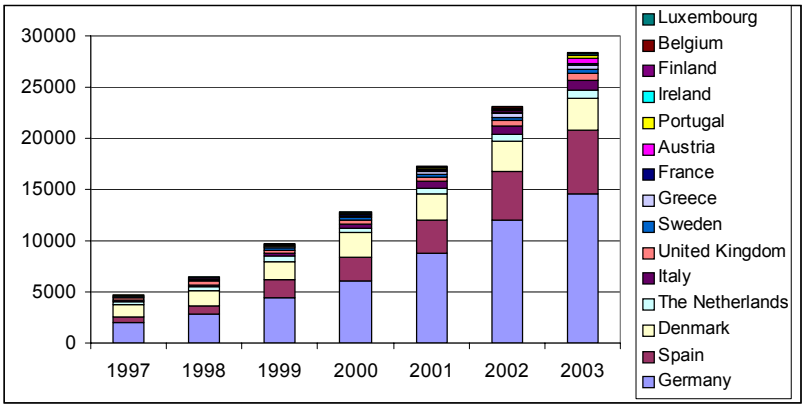


Figure 2: Wind energy capacity growth in EU15 1997-2003 – three leading markets

In 1997 and as part of the 12% target, the Commission hoped to see 40 GW of wind power capacity installed by 2010. This will clearly be exceeded. Industry estimates now suggest that 75 GW could be installed by 2010[7] (generating approximately 167 TWh per year).

7 Source: Wind energy –The Facts – March 2003.

However, the final result for 2010 will depend on the efforts of those Member States where wind energy has not yet taken off.

There are positive signals from UK, Austria, the Netherlands and Italy due to an improved policy framework. In other countries wind power is growing only slowly. In France, 91 MW was added in 2003 (as against 2.645 MW in Germany in the same year), with total capacity reaching 239 MW. In Greece 3.715 MW had been given first-step approval under national administrative procedures by September 2003 – but installed capacity was only 375 MW.

The experience of the three leading countries suggests that successful expansion of wind power benefits from:

- an attractive long-term financial framework,
- removal of administrative barriers through the implementation of uniform planning procedures and licensing systems,
- guarantee of a fair grid access and non-discriminatory tariffs,
- least-cost network planning.

The estimate of 75 GW of installed wind power capacity in 2010 includes 10 GW offshore. Offshore wind power will become more and more important as good wind sites on land are used up. Offshore wind power has several advantages. The wind is stronger and more reliable at sea (most marine sites in northern European waters are expected to deliver between 20% and 40% more wind energy than good shoreline sites). Neighbours fearing disturbance are fewer. However, the cost of generating electricity from offshore power plants is currently higher than from onshore plants.

Denmark, with the highest wind power share of any Member State, is pioneering offshore wind power. The UK announced in July 2003 that it would sponsor offshore projects. These are positive developments which other Member States could follow.

2.8.2. Electricity from biomass

Unfortunately, the success of the wind sector is not outweighing the slow growth of biomass electricity.

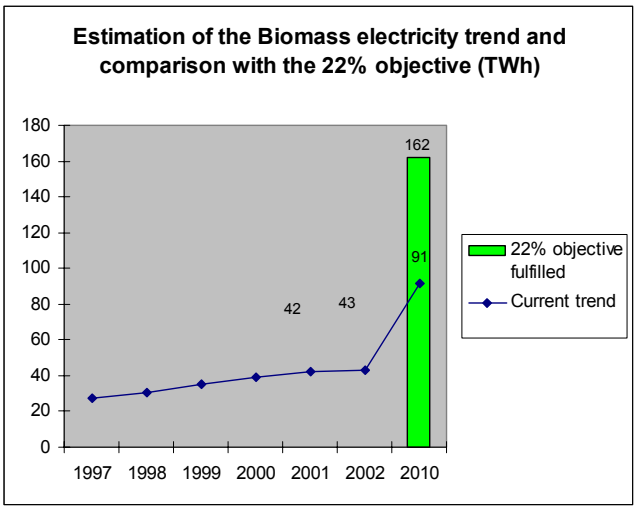
Between 1997 and 2001, Finland, Denmark and the UK (mainly using biogas) were the only countries in which biomass electricity grew steadily. In some countries the biomass contribution grew comparably but intermittently, and in others it stayed small. In general, coordinated policies are lacking and financial support is little.

In 1997, the Commission expected that 68% of the growth in electricity from renewable energy sources would come from biomass. 24% could come from wind power and 8% from a mixture of hydro, geothermal and photovoltaic power.

Now, the strong growth of wind power means that it can be expected to contribute 50% of the increase needed to achieve the target set in the Directive. Hydro, geothermal and photovoltaic power can be expected to contribute 10%. Consequently, the target will only be achieved if

biomass contributes the remaining 40%. It will need to grow from 43 TWh in 2002[8] to 162 TWh. This will require biomass electricity to grow by 18% a year – compared with a rate of only 7% a year over the past 7 years (see chart).[9]

In most of the new Member States there is an important potential for the use of biomass for both electricity and heat generation. This is particular true for the widely unexploited potential for electricity generation in Hungary, the Czech Republic, Slovakia, Latvia, Lithuania, and Estonia.



This requirement should be seen in the context of the need for increased quantities of biomass not only for electricity generation, but also for heating and transport (see Chapter 3), and the biomass potential for cogeneration applications.

2.8.3. Electricity from solar photovoltaics

In 2003, the photovoltaic industry produced some 740 MWp of photovoltaic modules world-wide, and it has become a 4 bill. € business. In the past 5 years, the yearly growth rate was more than 30% on average. Besides the exponential increase of the world market, the faster increase of the Japanese production capacities is of particular European concern.

Since the introduction of the German Feed-in Law in 1999 the European PV production grew in average by 50% /year and has reached 190 MW in 2003. Europe's world market share rose in the same time from 20% to 26%, whereas the US share decreased due to a weak home market and the Japanese share increased to 49%. European PV industry has to continue this growth over the next years in order to maintain its share. This however will only be possible, if reliable political framework conditions are created, in order to enable a return on investment for the PV industry. Besides this political issue targeted improvements of the solar cell and system technology are still required.

Although PV output is still small, its EU growth rate curve quite exactly mirrors that of wind power, with a delay of approximately 12 years. European installed PV capacity doubled

---

8 Source: Eurostat. Non-consolidated figures.

9 The 22% objective does not detail the penetration of the different sources of RES-E. It is the Member States' responsibility to detail the mix of renewables. Therefore, the sectoral breakdown of the target sketched here must be treated only as an estimate.

between 2001 and 2003, Germany accounting for more than 70% of the total. However, PV also doubled in Spain and Austria, whereas Luxembourg achieved the highest PV power *per inhabitant*: 8W per capita. If the whole EU did likewise, it would produce around 3.6 TWh/annum on 3.6 GWp installed PV capacity.

2.9. Conclusions on the development of electricity from renewable energy sources

Directive 2001/77/EC was the first legislative text to be adopted by the Council and the European Parliament explicitly aimed at the development of renewable energy.

In October 2002 Member States confirmed their national targets. Collectively, Europe confirmed its intent to achieve a 22% share of electricity from renewable energy sources by 2010.

October 2003 was the deadline for Member States to put in place the laws and administrative provisions necessary to comply with the Directive. All Member States have reported on their measures.

During 2002 and 2003 nine Member States implemented a new policy for the promotion of electricity from renewable energy (see Commission Staff Working Document). Two countries already had active measures in place. Progress towards meeting the targets set in the Directive has begun.

However, an analysis of national report shows that policies and measures currently in place will probably achieve a renewable energy share of only 18%-19% of the electricity market in 2010.

Administrative barriers such as long and complex authorisation procedures persist in some Member States due to insufficient coordination between different administrative bodies (Article 6). Current regulations on grid access do not guarantee a legal framework based on objective, transparent and non-discriminatory criteria (Article 7). Further progress in improving grid access for electricity from renewable energy is essential for stable growth.

Slow growth in the biomass sector is caused by inadequate support systems and a lack of coordinated policies. Support systems and policy refinements should be improved to enhance biomass energy use taking into account biomass potentials at regional and national levels.

Wind energy has grown impressively in three Member States and this success story should be extended to other Member States, implementing the success factors mentioned in Chapter 2.8.1. But even the booming of wind energy will not be enough to outweigh the slow development of biomass.

Extra efforts are needed, notably in the different biomass uses, offshore wind and financial support in general. Support also needs to continue for geothermal, mini-hydro and photovoltaic power (Japan has overtaken Europe in this field).

The Commission will closely monitor the situation in all Member States and the full implementation of all requirements of the Directive in order to prepare follow-up actions.

3. EFFORTS AND RESULTS FOR 2010

3.1. The legislative framework developed since 2000

Since 1997, the EU15 have been working towards the **general target** of an increase in renewable energy's share of gross inland energy consumption to 12% in 2010, compared with 5.2% in 1995.

To achieve this target, the Commission has adopted and proposed a considerable number of new legal instruments since 2000 aimed at promoting renewable energy and energy efficiency. The European Parliament and Council have adopted most of these proposals. The remainder are at an advanced stage of the inter-institutional process.

The legal instruments that have been adopted into law are notably:

- Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources (OJ L283/33, 27.10.2001)

- Directive 2003/30/EC on the promotion of biofuels (OJ L123/42, 17.5.2003)

- Directive 2002/91/EC on energy performance of buildings (OJ L1/65, 4.1.2003)

- Directive 2004/8/EC on the promotion of cogeneration (OJ L52/50, 21.2.2004)

- Directive 2003/96/EC for the taxation of energy products and electricity (OJ 283/51, 31.10.2003)

- Directive 2000/55/EC on energy efficiency requirements for ballasts for fluorescent lighting (OJ L279/33, 01.11.2000)

- Commission Directive 2002/40/EC on labelling of electric ovens (OJ L128/45, 15.05.2002)

- Commission Directive 2002/31/EC on labelling of airconditioners (OJ L86/26, 03.04.2003)

- Commission Directive 2003/66/EC on labelling of refrigerators (OJ L170/10, 09.07.2003)

- Regulation 2422/2001/EC on Energy Star labelling for office equipment (OJ L332/1, 15.12.2001)

And the proposals:

- COM (2003)453 of 01.08.2003 on Eco design requirements for energy using products

- COM (2003)739 of 10.12.2003 on energy efficiency and energy services

The impact of one measure – Directive 2001/77/EC – was analysed above. The impact of others will be addressed in this chapter. Calculation of their impact is possible on the assumption of full compliance and rigid implementation by national, regional and local

authorities. However, the example of Directive 2001/77/EC demonstrates that this should not be taken for granted.

There is abroad consensus that the EU Emissions Trading Scheme (ETS) will have a positive effect of the renewable energy uptake in the EU from 2005 onwards. In addition, the recently agreed Linking Directive will have a similar impact on the uptake of these technologies in developing countries and in economies in transition The EU ETS will by itself not guarantee that the 2010 target renewable targets will be reached as the scheme only covers the greenhouse gas benefits of renewable energies. The positive effect will affect the 2010 extrapolations, although this might be premature as the allocation of allowance has not yet been finalised.

It should also be taken into account that several measures, especially in the field of energy efficiency, will not have their full effect in the short or even the medium term (e.g. building improvements). This means that for these measures extrapolation of current trends is not possible and prognoses for 2010 can not yet include their full effect.

3.2. Member State Actions

Over the last two years, Member States have been implementing new policies in renewable energy. Legal frameworks are more structured and financial conditions are clearer.

But the overall picture is not so positive. There exists an imbalance between different countries' commitment to develop renewable energy.

The situation would be very different if wind energy performed across the Community at the level achieved by Denmark, Germany and Spain if biomass heating was as dynamic everywhere as it is in Finland or if geothermal energy managed the level of development being achieved in Sweden and Italy.

At Community level, the necessary legal and policy framework has been put in place, but responsibility for progress lies clearly with the Member States. Now is the time for Member States to step up their own action at local, regional and national level.

Member States are invited to maximise the use of the funds made available through the Structural Funds, to promote actions in favour of the renewables.

3.3. Community support instruments

The Community has only limited means for funding renewable energies. It can only intervene as a catalyst and supporting actor. The following actions were undertaken.

3.3.1. Community support programmes

Intelligent Energy – Europe programme (2003-2006)[10]

The multiannual programme Intelligent Energy – Europe (EIE) adopted in June 2003 builds on the success of programmes Save and Altener which have supported actions in the fields of

10 Decision No 1230/2003/EC of the European Parliament and the Council of 26 June 2003 concerning a multiannual programme for action in the field of energy, OJ L 176 of 15.7.2003, p 29.

energy efficiency and renewable energy since the early 1990s. It is important to note the growth of the Community budget allocated to action in Member States. The combined budget for both previous programmes in the decade 1993-2002 was 220 million euros, while the budget allocated to the new programme for the period 2003-2006 is 250 million euros.

EIE is intended to improve energy efficiency (Save actions), to promote new and renewable energy sources (Altener actions), to support initiatives tackling the energy aspects of transport (Steer) and to promote renewable energy and energy efficiency in developing countries (Coopener).

The EIE programme supports the implementation of Community legislation by catalysing national, regional and local efforts across the EU. It focuses on the removal of non-technical barriers, the creation of market opportunities, the drawing-up of standards and the setting up of training structures as well as on the development-planning and monitoring tools. It complements the RTD programmes, by tackling the market barriers which are frequently identified when implementing demonstration projects. It also encourages actions by local communities and by municipal and regional administrations and agencies, which are vital to establish sustainable markets for renewable energy.

The increasing importance and volume of the Community support has lead to the creation of the Executive Agency for Intelligent Energy to assist the Commission in the implementation of the EIE programme.

Research, Technological Development and Demonstration

The Sixth RTD Framework Programme (2002-2006)[11] contributes to the Union's efforts to promote sustainable development and the knowledge-based economy. Priority 6 of the current programme includes Sustainable Energy Systems. From a total RTD budget of €17.500 million, €810 million have been allocated to Sustainable Energy Systems: €405 million for medium and long-term research and €405 million for medium and short-term demonstration.

The short to medium term part of the programme concentrates on five research priorities:

- cost-effective supply of renewable energies,
- large-scale integration of renewable energy,
- eco-buildings,
- polygeneration,
- alternative motor fuels.

Within this part of the Programme the Commission has launched a major initiative – Concerto – which supports demonstration projects that are focused on optimising the energy flows in local communities through innovative integration of renewable energy and energy efficiency technologies. This initiative also addresses the important objective of involving local

[11] Decision No 1513/2002/EC of the European Parliament and the Council of concerning the Sixth Framework Programme of the European Community for research, technological development and demonstration activities (2002-2006), OJ L232 , 29.08.2002

communities in sustainable development activities. A similar initiative – Civitas – draws both on transport and research budgets to promote sustainable urban transport, including alternative motor fuels. The Commission has also launched several major initiatives including the Hydrogen and Photovoltaics Technology Platforms designed to provide a long-term vision and strategic roadmaps in these two key technologies.

In relation to renewable energies, the medium to longer term research programme includes the following research priorities:

- new and advanced concepts in renewable energy technologies,
- new technologies for energy carriers/transport and storage, in particular hydrogen,
- fuel cells, including their applications,
- socio-economic, energy and environmental modelling.

Besides, the Commission is launching two major initiatives in the field of Land Use and of Agriculture, which seek to contribute to design the EU Sustainable Development Strategy through the development of tools and methods for impact assessment of alternative policies. Among the agricultural and forestry land uses that will be considered, attention will be given to the production of biomass for renewable energy purposes. Finally, under the umbrella of the Environment Technologies Action Plan launched by the Directorate General for Research, renewable energy technologies will be analysed and promoted.

3.3.2. Dissemination – Public Awareness Campaigns

The Campaign for Take-Off (2000-2003)

The Commission launched the Campaign for Take-Off (CTO) for Renewable Energies[12] in 1999. It aimed to provide quantitative targets for 8 renewable energy sectors, serving as benchmarks for decision makers and planners to disseminate successful initiatives and to spread best practice and to raise the awareness of decision makers at local, regional, national and European level.

More than 125 renewable energy programmes and projects involving more than 600 partner organisations in the European Union – municipalities, agencies, technological institutes, regional authorities, national institutions, universities and enterprises – joined the Campaign as Renewable Energy Partners in 2000-2003.

3.4. Achieving the 12% target – the impact of Community legislation

3.4.1. Energy efficiency legislation

Energy efficiency is as important as renewable energy in increasing security of energy supply and reducing emissions of greenhouse gases.

[12] Commission staff working paper – Energy for the future: Renewable Sources of Energy (Community Strategy and Action Plan) – Campaign for Take-Off, SEC (1999) 504

EU energy efficiency policy has developed in a different way from policy for renewable energy.

Renewable energy policy began with a general target (the "12% target"). Next came sectoral directives for electricity and transport.

EU energy efficiency legislation dealt with individual products first. Before 2000, it covered minimum energy efficiency and labelling requirements for a variety of products – plus a voluntary agreement with car makers (the "ACEA agreement").[13]

In the years since 2000 the Union has continued with energy efficiency legislation for individual products, setting efficiency requirements for ballasts (a component of fluorescent lights)[14] and new labelling requirements for refrigerators, freezers, air-conditioners and household electric ovens.[15]

At the same time, the Union began to adopt legislation that addresses energy efficiency across whole sectors with directives covering energy efficiency in buildings, and combined heat and power.[16]

In mid-2003 the Commission proposed a framework Directive on Ecodesign for energy using products that should make it possible to set active minimum efficiency requirements or to promote the voluntary agreements in this field.

Finally and most recently, the Commission has proposed establishing for the Union a general energy efficiency target – by law. The Energy Services Directive would require Member States to reduce the amount of energy distributed to final customers by 1% a year.

The European Parliament and Council are currently considering Commission proposals for directives on Ecodesign and on Energy efficiency and energy services.

Energy efficiency measures can make it easier to achieve the 12% target for renewable energy by reducing the total volume of energy consumption against which this share is calculated.

The table shows the estimated impact of the adopted energy efficiency legislation on total EU15 energy consumption by 2010.

---

13 Although this agreement is expressed in terms of reductions in CO_2 emissions, it is being implemented mainly through improvements to the energy efficiency of cars.

14 Directive 2000/55/EC on energy efficiency requirements for ballasts for fluorescent lighting (OJ L279, 01.11.2000)

15 Directive 2003/66/EC of 03.07.2003 amending Directive 94/2/EC implementing Council Directive 92/75/EC with regard to energy labelling of household electric refrigerators, freezers and their combination, OJEU L170, 09.07.2003

16 Directive 2002/91/EC on the energy performance in buildings, OJ L1, 04.01.2003; Directive 2004/8/EC on the promotion of cogeneration, OJ L52, 21.02.2004

	SAVINGS IN PRIMARY ENERGY CONSUMPTION (MTOE)
BUILDINGS DIRECTIVE	9
COGENERATION DIRECTIVE	10
BALLASTS DIRECTIVE	1
OVEN AND AIR-CONDITIONER LABELLING	<0.5
REFRIGERATOR LABELLING	1
ENERGY STAR REGULATION[17]	ESTIMATE: 1
TOTAL	**22**

The Commission predicts that as a result of this new legislation total EU15 energy consumption in 2010 will be 1556 Mtoe, rather than 1578 Mtoe under the Commission's baseline scenario.

It should be emphasised that this estimate is not a full assessment of the impact of EU legislation because several measures will have their main impact only after 2010.

Directive 2002/91/EC on **energy performance of buildings** addresses the household and tertiary sector responsible for around 40% of the final energy demand in EU. The long term potential for energy savings is estimated at around 22%. The Directive introduces a common methodology for integrated energy performance standards for buildings, including integration of renewable energy supply and cogeneration. The standards are applied not only to new buildings but also in the event of the major renovation of large existing buildings. Buildings and dwellings must be certified when sold or rented out and energy saving measures must be identified. Boilers, heating and cooling installations must be inspected regularly and possible energy savings assessed. The Directive is to be transposed into Member States legislation at the latest in 2006.

The impact by 2010 is estimated to be primary energy savings of 9 Mtoe and reduced CO_2-emissions of 20 mtCO_2. This estimate is based on a model in which a fixed amount of improvement occurs each year, and this over a 6 year period.

Directive 2004/8/EC on the **promotion of cogeneration** aims to increase the share of high-efficiency cogeneration from the present level (2000) of 10% of all electricity consumption in EU. The Directive clarifies that good quality cogeneration of heat and power (CHP) saves at least 10% of primary energy consumption compared with separate production. Average

[17] Commission endorsed *voluntary programmes*, which will save at least another 1 Mtoe: GreenLight, Motor Challenge, the standby-power saving agreements for Digital TV and Power Supplies, and the CEMEP motor Agreement.

primary energy savings are likely to be around 20-25%. The potential share that can be delivered by high-efficiency cogeneration has earlier been calculated at 18% in 2010, but this will be reconsidered in the light of the reports Member States are due to make in 2006 on their national potential for high-efficiency cogeneration. Guaranteed grid access on fair terms, streamlining of administrative procedures and a system offering a guarantee of origin to help operators to promote high-efficiency cogeneration are the other instruments in the Directive. The Directive is fuel-neutral. It will promote renewable energy cogeneration alongside fossil cogeneration.

If the share of cogenerated electricity reaches 18% in 2010 this will result in primary energy savings of 18 Mtoe and a drop in CO_2 emissions of 42 $mtCO_2$ compared with a baseline of 13% CHP. The half-way scenario (15.5% CHP), shown in the table above, leads to primary energy savings of 10 Mtoe and emission reductions of 24 $mtCO_2$.

Energy efficiency should also be seen in a broad sense, like an extensive integration of processes both on the side of generation and consumption. Town planners inter alia have to be made aware of the substantial benefits of energy efficiency.

3.4.2. Legislation on electricity from renewable energy source

The **generation of electricity** accounts for about 45% of the energy consumed in the EU25.[18]

Electricity produced from renewable energy sources amounted to 384 TWh in the EU15 in 2001. This corresponds to a share of 15.2% (consolidated figures for 2002 are not yet available).

A detailed analysis of the Directive on electricity from renewable sources has already been given in Chapter 2.

3.4.3. Biofuels

By 2002, the market share of biofuels had peaked in France (1.3%). Across the whole EU15 the share of biofuels was 0.6% of the petrol and diesel market. In the Czech Republic biofuels had already a share of 1.3% of all automotive fuels in 2001. Poland has also adopted a new law on the promotion of biofuels entered into force on 1 January 2004.

Biodiesel from oilseeds is the commonest biofuel. It is blended with diesel. Bioethanol, made from sugarbeet or wheat, comes second [and is growing apace]. It is blended with petrol, partly in the form of alcohol, partly after transformation into ETBE. Other biofuels, derived from wastes and residues, account for only a small share.

Biofuels are relatively expensive although the additional costs are justified by benefits across several policy fields. In particular, they would provide additional and alternative supplies for fuelling the transport sector, which is almost completely dependent on one fuel – oil – and accounts for more than 30% of final energy consumption in the Community. Biofuels are at present the only technically viable means of using renewable energy to replace oil as a transport fuel. This means that biofuels offer particularly clear advantages in terms of security

[18] Substitution method; this is a share of gross consumption not final consumption; excluding non-energy uses.

of supply. Some of these advantages could be derived from biofuel imports given that biofuel has a different geopolitical origin to oil.

In addition, biofuels have a good employment balance – about 16 jobs per ktoe, nearly all in rural areas.

Taking into account the advantages of biofuels in terms of climate change, security of supply and rural employment, in 2001 the Commission proposed legislation to set targets for the use of biofuels in transport. A second proposal allowed Member States to exempt biofuels from fuel taxation without needing the prior approval of the Commission. These proposals led in 2003 to the adoption by the Council and European Parliament of the biofuels directive[19] and a provision in the energy taxation directive.[20]

The biofuels directive states that Member States "should ensure that a minimum proportion of biofuels and other renewable fuels is placed on their markets, and, to that effect, shall set national indicative targets". It sets reference values for these targets: 2% by the end of 2005 and 5.75% by the end of 2010. Member States are to report to the Commission each year on the measures taken to promote biofuels and on the share of biofuels placed on the market in the previous year. The first report, due by the end of June 2004, must contain a national indicative target for 2005. The report due in 2007 must do the same for 2010.

The Commission is required to report on progress by the end of 2006, and then every two years. If the report concludes that the indicative targets are not likely to be achieved for reasons that are unjustified, the Commission should make proposals that "address national targets, including possible mandatory targets, in the appropriate form".

The energy taxation directive states that – for as long as Community law does not lay down mandatory targets – Member States may exempt under fiscal control biofuels from fuel taxes, or apply a lower rate of tax. However, if Community law would impose mandatory targets, Member States could continue to grant tax reductions/exemptions in favour of biofuels through the procedure set by Article 19 of the Energy Tax Directive (proposal of the Commission, authorising decision by the Council). The present situation (as of March 2004) is that seven Member States have partly or completely detaxed biofuels (Austria, France, Germany, Italy, Spain, Sweden and the United Kingdom).

If the objectives set in the biofuels directive are achieved, the contribution of biofuels will increase from 1.4 Mtoe in 2001 to 19 Mtoe in 2010 – an increase of **18 Mtoe**.

The Commission will closely follow up the biofuels market and the transposition of the biofuels Directive, due for December 2004.

The progress of biofuels up to 2010 and beyond will be strongly influenced by and depend on developments in fuel quality standards, namely the competitiveness of biofuels, the development of new biofuels technologies, and the sourcing of biomass for biofuels.

---

[19] Directive 2003/30/EC of the European Parliament and of the Council of 08.05.2003 on the promotion of the use of the biofuels or other renewable fuels for transport, OJ L123, 17.05.2003

[20] Council Directive 2003/96/EC of 27.10.2003 restructuring the Community framework for the taxation of energy products and electricity, OJ L283, 31.10.2003

3.5. Renewable energy for heat production

Renewable energy in heating has grown slowly over the last seven years. The directive on the promotion of cogeneration (CHP directive) and the Building directive have a direct impact on efficient heat use. But there is no legislation in place addressing renewable heat production. It is still a sector dominated by traditional biomass use and a new dynamism is needed to deliver the necessary contribution to achieve the objective of a 12% share in renewables and to develop the sound potential that exists in the new Member States.

Heat from renewable energy sources is used in many different ways. Heat demand for industrial purposes often calls for high temperatures or steam at high pressure. For such requirements renewable heat will typically be provided via the combustion of biomass (wood or industrial waste and residues) preferably with co-firing of fossil fuels in boilers or CHP. When heat is needed for heating buildings and hot water, the demand can be met by a wider range of technologies and sources. For larger-scale demand such as district heating and major buildings (commercial/public/residential), centralised supply is possible and economies of scale can encourage investment in technology (large boilers, geothermal, CHP). Domestic heat demand and other small-scale demands can be met using other technologies such as solar panels, wood stoves, geothermal sources, etc.

3.5.1. The trend in geothermal

Direct heat is the oldest and the commonest use to which geothermal energy is put. Space and district heating, agricultural applications and aquaculture and industrial uses are well known examples.

Following the introduction of ground coupled heat pumps, space heating and cooling has expanded considerably over recent years. Sweden is at the top of the list with a capacity estimated at 1 GWth for 176,000 units in 2002, representing one-third of all the heat pumps installed in Europe. Germany and France come next. Italy is the leading country in the European Union for low-energy applications of geothermal energy with a capacity of 0.44 GWth, followed by France and Germany.

With 10% annual growth for heat pumps (the 2002/2001 growth rate was 14%), **the target calculated in 1997 of 5 GWth to be achieved by 2010 would be exceeded by 60%.**

Geothermal energy is a well-developed energy source in Hungary where the amount of power installed is similar to France. The Czech Republic, Slovakia, Slovenia and Poland use this renewable energy source mainly in the form of direct heat.

3.5.2. Solar thermal heat.

Solar thermal energy has taken off only in Germany, Greece, Austria and Cyprus. At the end of 2002 the installed surface of solar collectors in the EU15 was nearly 12.8 million square metres, compared with around 11.8 at the end of 2001. This increase was led by the German market. In 2002, 80% of the total solar thermal capacity of the EU15 was installed in the three leader countries. Austria, for example, has 9 times more thermal collectors than Spain. Among the new Member States, Cyprus stands out with about 600,000 square metres installed.

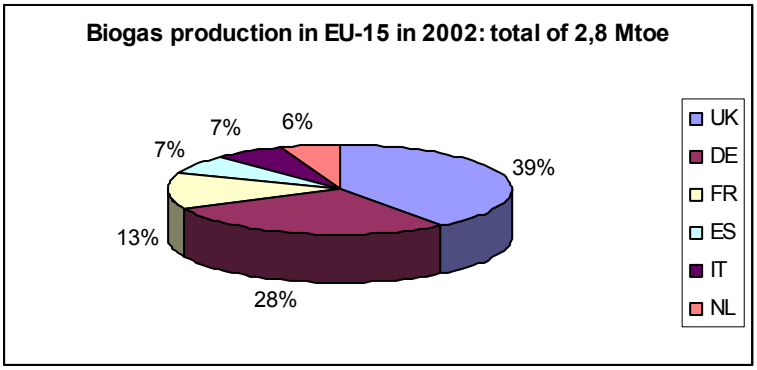
Solar thermal collectors cover two thirds of the warm water needs of Greek households, in Cyprus up to 90%, and nearly 10% in Austria. In Spain, Portugal and Italy only a marginal 0.5% of warm water needs is covered.

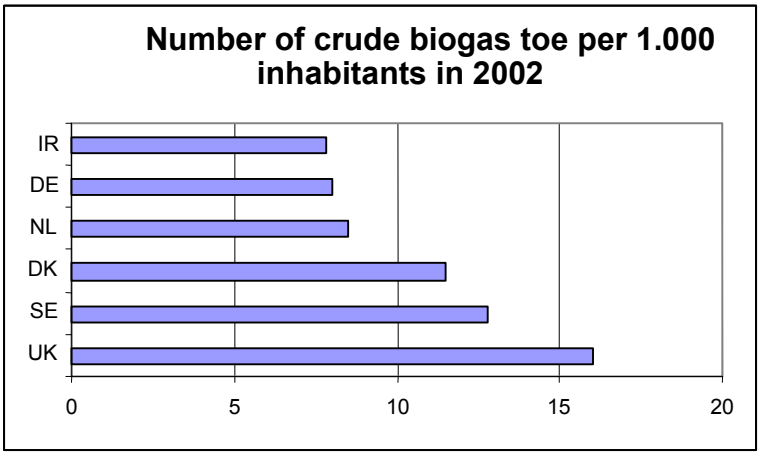
Solar thermal collector production has over the last four years grown at a rate of around 9%. However, unless far more significant steps are taken, the 1997 objective of installing 100 million m² of solar collectors in the EU15 by 2010 will not be achieved.

3.5.3. Biogas

Since the "environment" has become a full-fledged economic sector, the biogas sector has undergone constant development in most of the countries of the European Union. Biogas has the dual advantage of eliminating pollution while producing energy at the same time. Methanisation units have appeared across Europe. The biogas sector gives a value to different types of waste. This gas can be used to produce electricity, heat or as transport fuel. 60% of biogas is used in electricity production and 40% in heat production.

In 2002, EU15 biogas production was 2.8 Mtoe – 10% higher than in 2001. This growth rate is too slow to achieve the 15 Mtoe proposed for 2010.



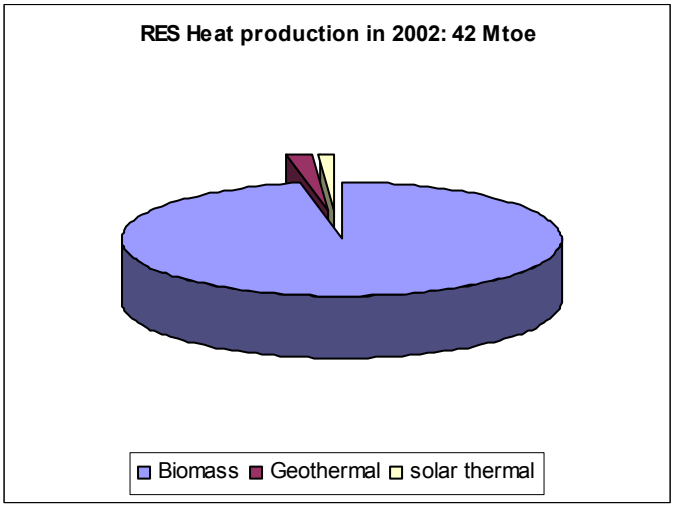


Biogas development needs coordinated policy in the fields of energy, environment and agriculture (cattle manure is one source of biogas).

3.5.4. Woody Biomass

Most of the biomass needed for heating is still, as it always was, wood – especially domestic use of wood. The biomass market for space heating is stagnant. Significant incentives are needed to overcome this problem and to encourage more efficient wood-burning stoves and boilers. CHP generation is a good option for the industrial-scale use of wood. The mid-term potential for the EU15 shows a more balanced split between the three technologies considered: biomass heat, geothermal heat and solar thermal installations (geothermal heat includes geothermal heat pumps).

Other forms of biomass, such as purpose-grown energy crops have been well proven and the technology and logistics to use them have been developed. They should be encouraged and significant incentives are initially necessary.



Examples of good practice are the Austrian programme to commercialise the use of wood and the French "Plan du Bois" which promotes the installation of efficient individual stoves and communal heaters. All such means to disseminate the spread of efficient practices in the use of wood as a fuel are to be encouraged.

3.5.5. Summary

There are some national success stories in woody biomass and solar heat. Geothermal heating is growing at a good speed. Nevertheless, the overall development of renewable energy in heating does not give rise to optimism. According to the figures shown in the table below, even if the targets for renewable electricity generation and biofuels are met, extra 29 Mtoe of renewable energy for heat production would still be needed to achieve the 12% objective by 2010.

RES HEAT POTENTIAL	1997	2001 RESULTS	2002 RESULTS	2010 HEAT CONTRIBUTION TO 12% TARGET[21]
EU-15	**38.7 MTOE**	**42.3 MTOE**	**43.3 MTOE**	**72 MTOE**
BIOMASS	38.04	41.1	42	66
GEOTHERMAL	0.4	0.7	0.8	4
SOLAR THERMAL	0.26	0.5	0.5	2

3.6. Conclusion: Scenario for the renewable energy share in 2010

The trends set out in the Commission Staff Working Document lead to the conclusion that, although progress towards meeting the targets has begun, the 2010 target will **not** be achieved under current policies and measures.

There is a strong need for more **political will** to invest in the EU into renewables.

- The share of renewable energy increased from **5.4%** in 1997 to **6%** in 2001.
- If present trends continue in heating, and if Member States implement the national plans they have put in place in electricity and fulfil the requirements of the biofuels directive in transport, the share will reach **9%** in 2010.
- In addition, if Member States fulfil in full the requirements of the directive on electricity from renewable energy sources, the share will reach **10%**.
- Fulfilment of the **12%** target for 2010 will require a step change in national policies towards the use of renewable energy in heating.

[21] The 72 Mtoe is the updated scenario.

	19	2001	2002 RESULTS	THE 12% TARGET FOR 2010		TREND I	TREND II	TREND III
RES ELECTRICITY TWH	33	384	NON CONSOLIDATED FIGURE	**630 TWH[22] - 666 TWH[23]**	**84 MTOE -93 MTOE (22.1 % ACHIEVED)**	**70 (18% ACHIEVED)**	**70 18% ACHIEVED)**	**89 (22.1% ACHIEVED)**
RES HEAT PRODUCTION	**38.**	**42.3**	**43.3**	**68-77 MTOE**		**54 (CURRENT HEAT TREND)**	**54 (CURRENT HEAT TREND)**	**54 (CURRENT HEAT TREND)**
BIOMASS	38.	41.1	42	66 MTOE				
GEOTHERMAL	0.4	0.7	0.8	4 MTOE				
SOLAR THERMAL	0.2	0.5	0.5	2 MTOE				
BIOFUELS	**0.2**	**0.3**	**0.8**	**19 (5.75% TARGET ACHIEVED)**		**10 (3% ACHI**	**18[24] (5.75 %**	**18 (5.75%**

22 Under an efficient scenario for electricity consumption, this 630 TWh will be equivalent to 84 Mtoe

23 Under a BAU scenario for electricity consumption, this 660 TWh will be equivalent to 93 Mtoe

24 In the case of biofuels, the figure given is in final energy.

					EVED)	ACHI EVED)	ACH IEV ED)
TOTAL				182 MTOE (12% ACHIEVED)	134 MTOE (8%)	142 MTOE (9%)	161 MTOE (10 %)

4. CONCRETE ACTIONS

4.1. New initiatives to reinforce the financing of renewable energy – action by Member States

Growth in the use of renewable energy is too slow to give confidence that the European Union's targets for 2010 will be met.

In electricity, the European Council and Parliament agreed in 2001 to aim for a renewable energy share of 22.1% in the EU15 by 2010. National targets adopted in 2002 were consistent with this objective. But the practical measures that Member States have put in place so far are estimated to deliver a share of only 18-19%.

In heating, most Member States have done little to stimulate new action.

In transport, only six Member States have made a start on the production of biofuels. Prospects will be clearer early in 2005 following transposition of the biofuels directive.

For renewable energy as a whole, the Community has been working since 1997 towards a renewable energy share of 12% by 2010. At best, with present trends and measures, the share achieved will be 10%. At worst, it will not rise above 8%.

Renewable energy's contribution remains marginal in most Member States, apart from two old-established uses: electricity from hydropower and traditional uses of wood for heating. However, renewable energy has begun to move from the wings to centre stage. This move must gather pace if the Union is to meet its objectives for sustainable development and security of energy supply. At Community level, the necessary legal and policy framework has been put in place. Now it is time for Member States to speed up their own action at local, regional and national level.

One important aspect is the financing of renewable energy. One estimate puts the gross investment cost for the EU15 to achieve the 12% target at €10-15 billion per year.[25] While Community funding plays a crucial catalytic role (see next section), the Community has still limited means to support the real development of renewable energy. Member States and the energy industries themselves have the resources needed to deliver this level of investment.

[25] A. Zervos, "Updating the impact of the Community strategy and action plan for renewable energy sources", draft final report, 2003 (based upon 2001 prices).

OVER TIME, EACH ENERGY SOURCE IN TURN HAS BENEFITED FROM SUBSTANTIAL PUBLIC FUNDING AND RISK SUPPORT IN ITS DEVELOPMENT. THE ESTABLISHED ENERGY SUPPLY INDUSTRIES NOW HAVE AN INCOME OF OVER €200 BILLION A YEAR IN THE EU15 ALONE. FOR THE SUPPORT OF RENEWABLE ENERGY SOURCES DIFFERENT MEANS ARE AVAILABLE TO BE USED BY MEMBER STATES, LIKE FEED-IN TARIFFS, GREEN CERTIFICATES, MARKET BASED MECHANISMS, TAX EXEMPTIONS… IT IS TIME FOR ALL MEMBER STATES TO PUT THESE IDEAS INTO PRACTICE. MEMBER STATES NEED TO CREATE A LEVEL PLAYING FIELD IN THE ENERGY SECTOR, BY INCLUDING EXTERNAL SOCIETAL BENEFIT/COSTS IN THEIR ENERGY POLICY FRAMEWORK.

4.2. New initiatives to reinforce the renewable energy and energy efficiency – action at European level

Clean energy policy shares fundamental goals with a wide range of such Community policies as enhancing competitiveness and cohesion for growth and employment, ensuring access to basic goods and services, and promoting the EU as a sustainable development partner.[26] Renewable energies and energy efficiency can do a great deal to address the challenges that other policies face. A coordinated approach is needed across the range of Community policies that have energy impacts.

The Union's future financial framework for 2007-2013 should have explicit provisions so that clean and efficient energy concepts are a visible part of the Union's priorities, strategies and commitments. It is the opportunity for the enlarged Union to express its political determination to change course and direct its efforts towards sustainable energy, by allocating adequate resources to boost its goals in this field.

The Community's main financial instruments – notably the future structural and cohesion funds, the financial support made available through the Community's international co-operation programmes, and the Common Agricultural Policy – all need to be mobilised.

In this respect, it is important to note that in February 2004 the Commission adopted a Communication regarding the reform of structural funds for the period 2007-2013. This report highlights the development and use of renewable energy, energy efficiency measures, the development of eco-industries, cleaner methods of transport and sustainable urban public transport as priority themes for future support.

Supplementary action could be explored in four fronts.

First, to bridge the gap between successful demonstration of innovative technologies and their effective entrance on the market to achieve mass deployment and to boost large-scale investment across the EU in new and best performing technologies.

[26] Communication from the Commission to the Council and the European Parliament "Building our Common Future: Policy challenges and Budgetary means of the Enlarged Union 2007-2013", COM(2004) 101 final of 10.2.2004

To achieve this, a new instrument is needed that operating at EU level could be tailored to accommodate the diversity and specificity of the renewables and energy efficiency sectors. This instrument should support the first market replications of just-proven technologies of European relevance. In this way the Union will share the risk that is involved in the economic exploitation of RTD results.

This new instrument could be the main component of the successor to the current "Intelligent Energy-Europe, 2003-2006" programme. It would ensure better exploitation (through large-scale application across the Union and on export markets) of projects' results and promote the substantial stock of technologies that are close to being competitive. Action at EU level, in concert with national initiatives and with action by international financial institutions, is needed to tackle this task effectively.

Second, this future Community programme "Intelligent Energy Europe" should also strengthen support for action at local and regional level. The main aim is to enable citizens to make informed decisions about energy and help to remove non-technological barriers to clean energy such as institutional capacity, public awareness, available technology at affordable prices, well-trained specialists and effective mechanisms for the exchange of know-how and best practice. A better focus is also needed for sharing European experience and technologies with third countries. This future programme should also continue to support the EU policy development and implementation in the renewables and energy efficiency fields.

Third, it is necessary to strengthen support and accelerate the pace of public support for research, technological development and demonstration in renewables and energy efficiency in Europe.

Fourth, it is necessary to capitalise on the important role that energy plays in sustainable development and share the responsibility with other Community policies.

In the framework of the reform of the Common Agricultural Policy a new aid of 45 € per hectare will be introduced for areas sown to energy crops. Furthermore, non-food production, for instance of energy crops will continue to be permitted on set-aside land.

The European Investment Bank has already set itself the target of increasing the share of renewable energy in its loans for energy from 8% to 16%. It could contribute to the financing of national, regional or private investment funds for renewable energy, along with contributions from other public sources at Community, national or regional level.

4.3. Other measures

4.3.1. A Community plan for biomass

In 2001 the EU15 used about 56 Mtoe of biomass for energy purposes. Achieving the Union's renewable energy targets for 2010 would need approximately 74 Mtoe more – 32 Mtoe for electricity generation, about 18 in the form of biofuels and 24 for heating (total: 130 Mtoe)

An indicative figure on the biomass availability for energy purposes at EU15 level is 150 Mtoe (additional 32 Mtoe for EU-10 and Romania and Bulgaria).[27]

The biomass potential needs further assessment, especially in terms of land availability, land use for different renewable biomass applications (heat, electricity, transport biofuels, and forest products) and the difference in benefits these various applications might have, for instance in terms of greenhouse gas emissions in a life cycle perspective.

However, effective use of biomass for energy purposes depends on the market developments as well as on the interactions between public policy in the fields of energy, agricultural, waste, forestry, industry, rural development, environment and trade policy. Community institutions play a key role in all these policy areas. By the end of 2005, the Commission will bring forward a coordinated biomass plan with a clear approach to securing adequate supplies of biomass through European, national and regional/local action across them all. This plan should ensure that the use of biomass for energy purposes does not lead to the undue distortion of competition. The plan will orientate and optimise Community financial mechanisms, re-direct effort within the policies concerned and tackle the obstacles to biomass deployment for energy purposes. Specific attention will be paid to the new Member States, taking into account the high and unexploited biomass potential that many of them have.

4.3.2. Developing renewable energy in heating

Targets for renewable energy sources' heating would be difficult to establish because there is no single "heating supply industry" to whom they could be addressed.

Instead, some specific initiative linked to heating and cooling applications will be brought forward as a first step.

The Community has already adopted directives on the energy performance of buildings[28] and cogeneration[29]. These will encourage greater use of renewable energy in heating. There is a need for the buildings directive to be implemented in a way that stimulates the integration of efficient biomass systems, geothermal heat pumps and solar thermal heating in residential and tertiary-sector buildings. The decentralised energy supply based on renewable energy that is envisaged under the Buildings Directive should look to the potential of using renewable energy for heating and cooling, in particular through integrating solar heating panels in buildings. Micro-turbines fired by biomass are another possibility for using renewable energy in buildings. There is also a need to encourage a greater share of biomass in cogeneration and in district heating systems, especially where existing systems can be economically refurbished (which is the case in many of the new Member States).

The Commission will bring forward further initiatives – if necessary, legislative proposals – to accelerate the fulfilment of the potential of three key technologies – modern biomass heating, solar heating and geothermal heat. These initiatives could include targets for specific technologies, or requirements for suppliers of heating oil and gas to supply e.g. wood pellets and biogas.

---

27 The estimation of this figure considers 10% of the arable land (half for biofuels and half from solid biomass), forest by-products, wet manure and organic waste. Source BTG Interim Report.

28 Directive 2002/91/EC on the energy performance in buildings, OJ L1, 04.01.2003

29 Directive 2004/8/EC on the promotion of cogeneration, OJ L52, 21.02.2004

4.3.3. Offshore wind policy

To give legal certainty for offshore wind development, governments will need to establish legal regimes that give them relevant jurisdiction for the area outside the territorial seas (12 nautical mile limit), and quick procedures for giving consent for development.

An off-shore wind policy for the EU will need to strengthen the necessary grid infrastructure. The Trans-European Energy Networks Programme has started to support investments for the grid adaptation and optimisation for the integration of off-shore projects.

It is important to ensure that the development of offshore wind is not stifled by a false assessment of potential problems such as its coexistence with birds, trawling and shipping, the development and application of national planning rules, the source of funds to extend and upgrade the grid, the availability of insurance cover and the provision of legal protection against damage to structures outside states' territorial waters. The Commission will systematically review the obstacles and objections that may block the development of offshore wind, the environmental requirements that need to be met and will develop guidelines for Member States, by offering proposals for legislation if necessary.

The Commission will also support research and development support to improve turbines and installation technology for use at sea and to improve the stability of the grid for wind energy penetration above 20%. It will also encourage the coordination of research being sponsored by national authorities on the effects of wind turbines on marine life and the marine environment.

4.3.4. Electricity from solar irradiation

Contrary to Japan, a strategically conscious industry policy, systematically developing towards a multi 10 billion € business is lacking in Europe. Despite the growth rate of European production during the last years and the strong European RTD and innovation base available, Europe is still a net importer of photovoltaic cells.

Continued, but evermore targeted RTD funding leads to new developments with respect to raw material use, evermore benign production technologies, optimised, often building integrated device design, reliability and efficiency of PV systems.

A further option is solar thermal electricity production, with some promising pilot projects just being launched in Southern Europe. This technology has the additional advantage that it can be cost-effectively combined with modern gas turbines, therefore overcoming the problem of intermittency of the solar irradiation and enabling a base load share of solar energy without storage technology.

4.3.5. Research and technological development

Several renewable energy technologies that could make a big contribution by 2020 need more research and development. The European Union has played a leading role in renewable energy research, demonstration and dissemination for more than 20 years and will continue to do so.

OECD data indicate that only 10% of government energy R&D budgets are related to renewable energy, in contrast with more than 50% for conventional (fossil fuel and nuclear) energy technologies. As indicated in paragraph 4.2, and in order to support the longer term

expectations regarding the penetration of renewables, it is therefore necessary to strengthen support and accelerate the pace of public support for research, technological development and demonstration in renewables in Europe.

Under the 6th Framework Programme, the Union is focussing on bringing costs down and on the large-scale integration of renewable energies in the energy supply system. For the short to medium term the programme is addressing electricity production from biomass, wind, photovoltaic power, tidal stream, wave and other renewable sources, heating and cooling technology, and the production and processing of liquid and gaseous biofuels. Long-term research looks at how to achieve significant cost reductions in bio-energy, photovoltaics, and other renewable energies including wind, ocean, concentrated solar, and geothermal as well as improving the reliability, safety, availability and durability of renewable energy systems. The programme also addresses the issues of distributed electricity generation, hydrogen and fuel cells which have an impact on the further development of renewable energy systems.

4.3.6. Using major Community financing instruments

The Commission intends from 2004 onwards to place special emphasis on the deployment of renewable energy and energy efficiency by using the structural and cohesion funds, and the EU development funds. Renewable energies could also play in the future an important role in the further evolution of the relevant rural development measures (second pillar of the Common Agricultural Policy).

4.3.7. Placing biofuels on the market

The fuel quality directive[30] lays down minimum specifications for gasoline and diesel. These limit the blending of biofuels. Higher blending limits would make it easier to fulfil and go beyond a 5.75% share for biofuels. The scope for raising these limits is the subject of technical debate. The Commission is evaluating the arguments. It will bring forward new proposals, if necessary, by the end of 2005.

Member States may require each company to place on the market on the Member State's territory a given quantity of biofuels, but may not require that all fuel sold is blended with biofuels. Alongside its review of fuel quality specifications the Commission will consider whether this needs to change.

4.3.8. Timely data

Official European data on renewable energy sources' contribution is currently available about 18 months after the end of the calendar year in question. The Commission will make data available more quickly. It will examine how extrapolation from samples could give an earlier indication of progress and how data gathering could be linked to the certification of renewable energy, as well as techno-scientific efforts to identify and validate trends.

---

30 Directive 98/70 of 13.10.1998 relating to the quality of petrol and diesel fuels (OJ L350/58, 28.12.1998), amended by directive 2003/17 of 03.03.2003 (OJ L76/10, 22.03.2003)

5. INTERNATIONAL POLITICAL CONTEXT AND EU PERSPECTIVES BEYOND 2010

5.1. The Lisbon process and the environmental dimension

The European Council of Lisbon of March 2000 agreed in its Conclusions (5) on a *"**new strategic goal** for the next decade: to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion"*.

INCREASING THE SHARE OF RENEWABLE ENERGY SOURCES IN THE ENERGY MIX CONTRIBUTES TO THE GOAL OF THE LISBON PROCESS TO BECOME CAPABLE OF SUSTAINABLE ECONOMIC GROWTH.

The wind industry currently employs 75 000 people in the EU15. The German Government has confirmed the net creation of 135 000 jobs through its national policy on renewable energy up to 2003. Nearly 100% of renewable energy production uses European technology. Increasing the share of renewable energy sources creates new jobs – in research, industry and building sectors, agro and forest-based industry, waste treatment and consulting – by developing new technologies and by encouraging research and technical innovation. It is estimated that if renewable energy supplies 12% of EU15 energy consumption in 2010, the sector will employ between 500 000 and 650 000 people in serving this EU market. It is for Member States to decide to put in place an energy policy that can deliver significant employment benefits.

European industry is the world leader in wind technology and holds a good position in hydro, photovoltaic and geothermal power. Export markets constitute a huge potential for the European renewable energy industry, which will benefit from the expertise gained in the domestic market. Export of renewable energy technology will create a significant number of extra jobs.

The Göteborg European Council of June 2001 agreed on a strategy for sustainable development and added an environmental dimension to the Lisbon process. In its Conclusions (21) it *"invites the industry to take part in the development and wider use of new environmentally friendly technologies in sectors such as energy and transport"* and *"stresses the importance of decoupling economic growth from resource use."*

5.2. The Johannesburg conference and its follow-up

The World Summit on Sustainable Development (WSSD) held in Johannesburg in September 2002, addressed the broad aspects of sustainable development with a strong focus, on the need to alleviate poverty as a matter of urgency. One of the main outcomes of the WSSD, was the general acceptance that energy, and in particular renewable energy, was one of the key priorities to alleviate poverty and to achieve long-term sustainable development.

In Johannesburg, the EU committed itself to taking a lead through the EU Energy Initiative for Poverty Reduction and Sustainable Development (EUEI) and through the Johannesburg Renewable Energy Coalition (JREC). One of the first concrete actions taken by the Commission in support of the EUEI was to launch COOPENER within the Intelligent Energy – Europe programme, to encourage the provision of sustainable energy services for poverty alleviation in developing countries.

THE SUPPORT TO THE PROVISION OF WATER ACCESS AND MODERN ENERGY SERVICES IN THE FRAMEWORK OF POVERTY ERADICATION IS NOW A COMMITMENT OF EUROPEAN DEVELOPMENT AID ENTERED AT WSSD. RENEWABLE ENERGY DEPLOYMENT AND TECHNOLOGY TRANSFERS TO DEVELOPING COUNTRIES CONTRIBUTE TO POVERTY ERADICATION AND TO RAISING THE STANDARDS OF LIVING IN THE POOREST COUNTRIES.

Since its launch, JREC developed its activities in close partnership and with the support of a broad stakeholder community, including business, NGOs and academia. JREC membership is nevertheless the privilege of national governments. As of March 2004, 87 countries joined the Coalition and more are expected to do so.

JREC meetings have already offered a unique platform for a constructive dialogue between many governments from the Northern and Southern hemisphere. In this context, and based on discussion amongst JREC Members following the WSSD, it is for example clearly acknowledged that the respective member-governments are best placed to develop and adopt ambitious national and regional time-bound targets.

JREC Members are equally committed to identify and remove financing gaps and obstacles, including obstacles for the effective delivery of existing – but often untapped – public and private resources needed to develop and strengthen renewable energy markets with a particular focus on the needs of developing country members.

JREC priorities and actions have been developed during informal high-level conferences and meetings, which have also served as a high-level platform to increase the regional and international awareness of the actions undertaken by pro-active governments thereby also assisting them in attracting interest from the finance and business community.

The International Conference for Renewable Energy, to be held in Bonn in June 2004, will follow up the Johannesburg conference. It aims to produce a strong political declaration together with an ambitious international action plan accompanied including various commitments and guidance for good policy.

In its capacity of hosting the JREC secretariat, the Commission started two key initiatives, to support the JREC and in particular the developing country members[31], i.e.:

- A global on-line renewable energy policy and measures database to tackle the significant information deficit in the area of policy design and implementation, in particular at the level of non-OECD countries;

- A feasibility study for the creation a public-private fund-based mechanism for the creation and delivery of "patient risk capital" to offer renewable energy business and project developers – in particular in developing countries and economies in transition, increased access to risk capital and to encourage a more significant

[31] The Commission has carefully selected and developed these initiatives in view of the developing country needs whilst also considering the need to complement existing and new instruments developed under the COOPENER, EU EI and other related programmes.

engagement from international and local financial intermediaries and corporate investors.[32]

The Commission will further develop these cross-cutting actions with interested JREC members and other stakeholders.

In January 2004, a European preparatory conference organised by the European Commission and held in Berlin concluded that:

- Implementation of Community Directives in Member States should provide for long-term domestic support that guarantees stable investment conditions. Administrative barriers to the distribution of green electricity should be overcome and progress is needed in the field of intelligent grid management.

- Progress achieved in Europe concerning renewable energy consumption reveals that, while electricity production, mainly from wind, is increasing dramatically, biomass electricity and technologies for the production of heat and cooling are not progressing enough. In addition, Member States' efforts are very unbalanced. The heating and cooling sector is calling on the Commission to propose Community initiatives.

- Distortion of the energy market, mainly due to the fact that energy prices do not reflect the full socio-economic costs, was highlighted as a barrier to create a level-playing field. The principle "polluter-pays" should be applied to energy.

Concerning renewable energy targets, there was a common understanding that the EU general renewable energy target for 2010 has been a driving force in the legislative and policy process at domestic and European levels. This long-term approach needs to be carried forward. The conference noted that a range of technical studies suggest a target of at least 20% of gross inland consumption in 2020 for the enlarged EU25.[33]

5.3. The role of targets at EU level

Since 1997 EU policy has been guided by the objective of a 12% share of renewable energy. A number of Member States have set national targets for the share of renewable energy sources in their national energy mix and this should be encouraged. The Commission has proposed and the Council and the European Parliament have adopted operational targets for 2010 on electricity from renewable energy sources and biofuels. Moreover a large range of legal measures in efficiency and support measures have been adopted at EU level. Because development is still too slow to reach the 12% objective, the present Communication

---

[32] This study is carried out by a consortium of financial engineers, private equity layers and technology consultants. Provided it could be established, patient risk capital would be a type of equity or quasi-equity finance obtained from blending public and private sector investment resources and requirements. It would provide equity funding in the expectation of a return, but on a less demanding basis than pure market private equity capital.

[33] This target would be equivalent to about 23% under the "substitution approach". The use of the substitution approach would have several advantages. It would give a more balanced reflection of the contribution of different forms of renewable energy, reflect the objectives of renewable energy policy in terms of substitutions for the use of fossil fuels and thus reducing CO_2 emissions and improving security of supply and allow a clearer comparison between the effects of renewable energy and energy efficiency measures.

announces additional measures. It is now time for all Member States to use the legal tools that have been developed at Community level in order to deliver on these operational targets and to increase the share of renewable energy sources in their national energy mix to such an extent that the 12% objective for the EU can be attained.

In April 2004, the European Parliament considered the recommendations of the Berlin Conference. It urged the Commission and the Council to start a political process of setting ambitious, time tabled targets for increasing the share of renewable energy in final energy consumption, addressing the medium and long-term time frame in advance of the International Conference in Bonn, and called upon the Commission and the Council to make the necessary efforts to reach a target of 20% for the contribution by renewable energy to domestic energy consumption in the EU by 2020.[34]

The Commission acknowledges the importance of providing a longer term perspective, considering in particular the infant nature of the renewable energy industry and the need to ensure sufficient investors' security. Acknowledging the outcome of the currently available feasibility studies, however, the Commission considers it necessary to more thoroughly assess the impacts of RES resources, notably with regard to their global economic effects before deciding on adopting targets beyond 2010 and before taking a position on the above-mentioned 20% target for the share of renewable energy in 2020.

The Commission will carry out regular reviews of progress in the development of renewable energy sources, with the aim also of ensuring compatibility with its overall sustainable development strategy. This will require an extended impact analysis of its policy. In the case of the economic dimension this will take into account the competitiveness of the EU economy on the one hand, and the security of supply on the other hand, as well as its technical feasibility. In the case of the environmental dimension, the required contribution to EU goals on climate change and other environmental priorities will be addressed. Finally the potential for the development of renewable energy resources should also be taken into account.

This review will be carried out for the first time not later than the end of October 2005 with a view to opening a debate in order to set in 2007 a target for the period after 2010.

By starting the process for establishing a longer term perspective for renewable energy, the European Commission wants to contribute to the continued leadership already shown by some JREC members, including some EU Member States.

6. ZÁVERY

Obnoviteľná energia má vlastný potenciál. Ten je dôležitý v situácii, keď dodávky energií EÚ vykazujú štrukturálne nedostatky a geopolitické, sociálne a environmentálne nedostatky, pokiaľ ide o európske záväzky v protokole z Kjóto. Potenciál rozvíjajúcej sa Európy na využívanie obnoviteľnej energie prispeje k bezpečnosti energetických dodávok, zníži dovoz palív a závislosť, zníži emisie skleníkových plynov, zlepší ochranu životného prostredia, odstráni väzbu medzi hospodárskym rastom a využívaním zdrojov, vytvorí pracovné príležitosti a zjednotí úsilie smerom k spoločnosti založenej na vedomostiach. Na celom svete nastal čas zabezpečiť, aby sa tento potenciál naplnil s cieľom zmierniť chudobu a zlepšiť

[34] P5_TA-PROV(2004)0276 International Conference on Renewable Energy (Bonn, June 2004)

prístup k energii tým najchudobnejším ľuďom. Pokiaľ ide o Európsku úniu musia sa však vykonať ďalšie kroky v mnohých členských štátoch s cieľom akcelerovať nárast využívania obnoviteľnej energie, a tým zabezpečiť splnenie cieľov Únie.

Pre **Európsku úniu** toto oznámenie poskytuje základ správy o doteraz dosiahnutom rozvoji a vyvodení záverov, takto:

(i) Za posledné štyri roky sa realizoval komplexný regulačný rámec EÚ.

(ii) Ciele EÚ na rok 2010 budú dosiahnuté iba úplnou realizáciou tohto právneho rámca zo strany členských štátov spolu s doplňujúcimi proaktívnymi opatreniami upravenými na národné podmienky;

(iii) Dodatočné opatrenia – predovšetkým finančné, ako sa uvádza v kapitolách 2.9 a 4, sú taktiež potrebné na úrovni EÚ;

Ako príspevok k **Bonnskej konferencii o obnoviteľnej energii v júni 2004,** oznámenie zdôrazňuje prístup Komisie k politike obnoviteľnej energie.