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KOMISJONI TEATIS

Biomassi tegevuskava

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1. SISSEJUHATUS

Energial on oluline osa majanduskasvu, töökohtade loomise ja jätkusuutlikkusega seotud Euroopa eesmärkide saavutamisel. Naftahindade kõrge tase toob päevakorda Euroopa kasvava sõltuvuse imporditavast energiast.

Euroopa Liit peab sellele väljakutsele jõuliselt reageerima. Energiapoliitika keskset tähtsust, mis aitab Euroopal toime tulla globaliseerumise probleemidega, kinnitasid liidu riigi- ja valitsusjuhid mitteametlikul Hampton Courti tippkohtumisel 2005. aasta oktoobris.

Seda silmas pidades vaatab komisjon praegu põhjalikult üle oma energiapoliitikat. Kõnealust teemat käsitleb ka 2006. aasta kevadel esitatav roheline raamat, millel on kolm peamist eesmärki: konkurentsivõime, jätkusuutlikkus ja varustuskindlus.

Kõnealuse poliitika olulised suunad seoses tugevama majanduskasvuga on vajadus vähendada energianõudlust;[1] suurendada taastuvate energiaallikate kasutamist, arvestades nende omamaiseid tootmisvõimalusi ja nende säästvust; mitmekesistada energiaallikaid ning laiendada rahvusvahelist koostööd. Need tegurid võivad aidata Euroopal vähendada sõltuvust imporditavast energiast, parandada jätkusuutlikkust ning elavdada majanduskasvu ja töökohtade loomist.

Edu saavutamine eeldab nende eesmärkide järjepidevat haldamist asjakohaste ajakavade piires. Kõnealune tegevus hõlmab mehhanisme liikmesriikide, Euroopa Parlamendi ja sidusrühmade kaasamiseks.[2]

Komisjon esitab käesoleva tegevuskava just selles laiemas kontekstis, mis hõlmab integreeritud ja ühtset energiapoliitikat, eriti aga taastuvate energiaallikate edendamist. See on vaid üks osa meetmetest, mida on vaja eespool nimetatud eesmärkide saavutamiseks – kuid see osa on oluline, sest praegusel ajal annab biomass ligikaudu poole Euroopa Liidus kasutatavast taastuvenergiast.[3]

Euroopa Komisjon võttis oma 2004. aasta teatisega taastuvenergia osa kohta Euroopa Liidus endale ülesande esitada biomassi tegevuskava, tõstes esile vajadust rakendada biomassipoliitika suhtes kooskõlastatud lähenemisviisi.[4] 2004. aasta kevadine ülemkogu järeldas, et taastuvenergia ulatuslikum kasutamine on hädavajalik „nii keskkonna kui ka

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1 Seda on käsitletud hiljutises energiatõhusust käsitlevas rohelises raamatus „Kuidas saavutada vähemaga rohkem" (KOM (2005) 265).

2 Need mehhanismid hõlmavad energia- ja transpordifoorumit, säästva energia foorumit Amsterdamis, fossiilkütuste foorumit Berliinis, elektrienergia reguleerimise foorumit Firenzes ning gaasisektori reguleerimise foorumit Madridis. Lisaks otsustas komisjon hiljuti asutada kõrgetasemelise töörühma konkurentsivõime-, energia- ja keskkonnaküsimuste käsitlemiseks.

3 „Asenduspõhimõtte" järgi 44%; klassikalise lähenemisviisi järgi 65% – vt mõjuhinnangu punkt 2.

4 „Taastuvenergia osa ELis", KOM (2004) 366, punkt 4.3.1.

konkurentsi seisukohast",[5] Euroopa Parlament aga märkis hiljuti, et „biomassi kasutamine pakub tavapäraste energiaallikate ja ka teatud teiste taastuvate energiaallikatega võrreldes mitmeid eeliseid, eelkõige küllaltki madalaid kulusid, väiksemat sõltuvust lühiajalistest ilmamuutustest, piirkondlike majandusstruktuuride edendamist ja alternatiivseid sissetulekuallikaid talunikele".[6]

Käesoleva tegevuskavaga nähakse ette meetmed, et hoogustada puidust, jäätmetest ja põllumajanduskultuuridest saadava energia arengut, luues turupõhiseid stiimuleid selle kasutamiseks ja kõrvaldades kõnealuse turu arengu ees seisvaid tõkkeid. Sel viisil saab Euroopa vähendada oma sõltuvust fossiilkütustest, piirata kasvuhoonegaaside heitkoguseid ning elavdada majandustegevust maapiirkondades. Kõnealused meetmed on loetletud 1. lisas.

See tegevuskava on esimene, koordineeriv samm. Sellega nähakse ette meetmed biomassi edendamiseks soojusmajanduses, elektrienergeetikas ja transpordis ning valdkondadevahelised meetmed, mis soodustavad rahastamist, biomassiga varustamist ja uurimistegevust. Selle juurde kuulub üldine mõjuhinnang. Teise sammuna pakutakse välja üksikmeetmeid kooskõlas mõjude erihinnanguga vastavalt komisjoni eeskirjadele.

1.1. Biomassi võimalused

Praegu rahuldab EL biomassi abil 4% oma energiavajadustest. Oma võimalusi täielikult ära kasutades saaks Euroopa Liit biomassi kasutamise 2010. aastaks rohkem kui kahekordistada (69 mtoe[7] 2003. aastal ja ligikaudu 185 mtoe 2010. aastal) – järgides seejuures head põllumajandustava, kaitstes jätkusuutlikku biomassitoodangut ja mõjutamata oluliselt omamaist toidutoodangut.[8] Bulgaaria ja Rumeenia ühinemine Euroopa Liiduga suurendab biomassi kättesaadavust[9] ning impordi pakutavad võimalused ei ole end veel ammendanud.

Komisjoni hinnangul võiks biomassi kasutamine tänu käesolevas tegevuskavas pakutavatele meetmetele suureneda 150 miljonile tonnile naftaekvivalendile 2010. aastal või veidi hiljem.[10] See on vähem kui täielik potentsiaal ja on kooskõlas soovituslike taastuvenergiaeesmärkidega.[11]

1.2. Kulud ja kasu

Mitme teadus- ja majandusuuringu järgi võiks kõnealune biomassi kasutamise kasv tuua 2010. aastaks järgmist kasu:

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5 Brüsseli Euroopa Ülemkogu, 25. ja 26. märts 2004, eesistujariigi järeldused.

6 Resolutsioon „Taastuvenergia osakaal ELis", 28. septembri 2005. aasta täiskogu istung.

7 Miljonit tonni naftaekvivalenti.

8 Euroopa Keskkonnaagentuur, *„How much biomass can Europe use without harming the environment", Briefing* 2/2005; vt 2. lisa.

9 Näiteks on nii Bulgaarias kui ka Rumeenias 0,7 hektarit põllumajandusmaad elaniku kohta, samas kui ELi 25 liikmesriigis on see näitaja 0,4 hektarit.

10 Vt 3. lisa ja mõjuhinnang.

11 Need eesmärgid 2010. aastaks on järgmised: taastuvenergia osa kõikidest energiaallikatest on 12% ja elektritootmise energiaallikatest on 21% ning biokütuste osa kõikidest kütustest on 5,75%. Komisjoni prognoosib, et selline osakaal on tegevuskavas esitatud meetmete abil saavutatav – taastuvenergia osakaalu puhul kui mitte aastaks 2010, siis aasta või kaks hiljem.

- Euroopa energiavarustuse mitmekesistumine, millega taastuvenergia osa suureneks 5% võrra ning sõltuvus importenergiast väheneks 48%-lt 42%-le;[12]

- kasvuhoonegaaside heitkoguste vähenemine 209 miljonit tonni CO2eq aastas;[13]

- otsene tööhõive kuni 250 000 – 300 000 inimesele, peamiselt maapiirkondades. Eri uuringutes on pakutud väga erinevaid arve;[14]

- väiksemast naftanõudlusest tulenev võimalik surve naftahinna languseks.

Eeldusel, et fossiilkütuste hinnad on praegustest ligikaudu 10% odavamad, võib otseselt arvutatavat kulu prognoosida 9 miljardile eurole aastas – 6 miljardit eurot transpordis kasutatavale biokütusele ja 3 miljardit eurot elektrienergia tootmiseks kasutatavale biomassile (soojusmajanduses on biomass sageli kulude poolest konkurentsivõimeline).[15] See on samaväärne bensiini või diislikütuse hinnatõusuga ligikaudu 1,5 senti liitri kohta ja elektrienergia hinnatõusuga ligikaudu 0,1 senti kilovatt-tunni kohta.[16]

Samuti võib oodata kasu Euroopa Liidu tehnoloogilise juhtpositsiooni laiendamisest nendes sektorites.

Seda kasu on eeldatavasti võimalik saavutada ilma lisareostuse ja muude keskkonnakahjustusteta.[17]

Komisjon hindab praegu panust, mille taastuvenergia võiks anda energia valikusse 2020. aastaks. Käesolev tegevuskava võiks aidata suurendada taastuvenergia osa 2020. aastaks.

1.3. Biomassi kasutamine transpordis ning elektrienergia ja soojuse saamiseks

Viimase nelja aastaga on naftahinnad kolmekordistunud. Transport on üks majanduse peamisi sektoreid – peaaegu kogu seal kasutatav energia saadakse naftast. Vedelatel biokütustel kui ainsal otsesel nafta aseainel transpordis on õigustatult suur poliitiline prioriteet.

Lisaks ei ole transpordisektori pidev kasv seni võimaldanud kasvuhoonegaaside heitkoguseid stabiliseerida, hoolimata tööstuse märkimisväärsetest jõupingutustest. Biokütused on kulukas viis kasvuhoonegaaside heitkoguste vähendamiseks, kuid transpordis on see üks kahest meetmest, mille abil saaks üldse mõistlikult neid lähitulevikus oluliselt vähendada (teine meede on autotootjate kokkulepe vähendada uute autode CO_2 heitkoguseid – vt punkt 4.2).

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12 Vt mõjuhinnangu punkt 5.

13 Vt mõjuhinnangu punkt 5.

14 See arv eeldab, et 70–90% biomassist toodetakse ELis. Otsese tööhõive puhul on biokütused ELis harilikult 50−100 korda tööjõumahukamad kui fossiilkütustest alternatiivid; biomassist toodetav elekter on 10−20 korda tööjõumahukam; biomassküte on kaks korda tööjõumahukam. Kaudsete mõjude suhtes on märkuste esitajad eri arvamustel. Mõned osutavad multiplikaatoritele või ekspordivõimalustele, mis võiksid otsese mõju väärtust kahekordistada. Teised vaidlevad vastu, et bioenergia sektoris loodavad töökohad asendavad teised töökohad ning kokkuvõttes oleks mõju tööhõivele null. (Vt mõjuhinnangu punkt 5)

15 Vt mõjuhinnangu punkt 5.

16 Nafta maksab ligikaudu 60 dollarit barrelilt ehk (praeguste vahetuskursside järgi) 48 eurot barrelilt. Selleks et biodiislikütus oleks konkurentsivõimeline, peaks nafta hind olema umbes 75 eurot barrelilt, ning bioetanooli hind peaks olema 95 eurot barrelilt. Kui fossiilkütuste hinnas kajastuksid ka väliskulud, oleks rohkem biomassiliike konkurentsivõimelised.

17 Vt 4. lisa.

Komisjon esitab 2006. aasta alguses teatise, milles käsitletakse eelkõige biokütuseid.

Samal ajal kui transpordis kasutatavad biokütused on kõige tööjõumahukamad ning toovad kõige suuremat kasu energiavarustuse tagamisel, toob biomass kõige suuremat kasu kasvuhoonegaaside seisukohalt ning biomassiga kütmine on odavaim. Biomassi kasutamist tuleks edendada kõigis kolmes sektoris. Vähemalt kuni 2010. aastani ei teki suurt konkurentsi tooraine pärast – biokütused tuginevad peamiselt põllumajanduskultuuridele, elektrienergia ja soojuse tootmine aga peamiselt puidule ja jäätmetele.

2. BIOMASSKÜTE

Biomassi kasutamise tehnoloogia elamu- ja tööstushoonete soojusvarustuses on lihtne ja odav. Biomassi kasutamisel on tugev traditsioon ning just selles sektoris kasutatakse enamik biomassist. On olemas uued tehnikaid, millega saab muuta puidu ja keskkonnaohutud jäägid standarditud graanuliteks, mis on keskkonnasõbralikud ja mida on hõlbus käidelda.

Kõigest hoolimata on suureneb biomassi kasutamine võrreldes teiste küttematerjalidega kõige aeglasemalt.

Jälgides hoolikalt energia koostootmist – biomassi jaoks olulist rakendusala – käsitlevate ühenduse õigusnormide[18] rakendamist, püüab komisjon seda küsimust lahendada järgmiste meetmete kaudu.

2.1. Õigusaktid taastuvenergia kasutamise kohta soojusmajanduses

Seda osa praegu elektrienergeetikat ja transporti käsitlevate direktiivide seas ei ole. Komisjon hakkab 2006. aastal neid õigusakte välja töötama. Nende puhul on vaja kasutada teistsugust lähenemisviisi kui varasemate direktiivide puhul, sest põhiprobleemid seisnevad turu kindluses ja suhtumises, mitte kuludes. Läbi tuleb vaadata küsimused, mis hõlmavad:

- soojusmajanduses taastuvenergia kasutamist käsitlevaid uusi eriõigusakte, mis põhinevad sellel, millised tulemused on järgmiste tegurite kriitilisel läbivaatamisel:
  - meetmed, millega tagada, et kütusetarnijad teevad biomasskütused kättesaadavaks,
  - tõhususe kriteeriumid biomassi ja seda kasutavate seadmestike suhtes,
  - seadmete märgistamine, et võimaldada inimestel osta keskkonnahoidlikke ja tõhusaid seadmeid,
  - muud tehnilised meetmed;
  - eesmärkide seadmise asjakohasus,
  - vabatahtlikud kokkulepped tööstussektoriga;

[18] Direktiiv 2004/8/EÜ energia koostootmise edendamise kohta, 11.2.04

- ehitiste energiatõhususe direktiivi muutmist, et suurendada stiimuleid taastuvenergia kasutamiseks;[19]

- uuringut selle kohta, kuidas parandada kodumajapidamiste biomassikatelde tehnilisi omadusi ja vähendada reostust,[20] et määrata kindlaks nõudeid ökodisainidirektiivi raames.[21]

2.2. Kaugkütte uuendamine

Kaugküttega saab lihtsamalt korraldada taastuvkütuste kasutamist ning põletada rohkem kütuseliike väiksemate heitkogustega. Hõlpsam on arendada biomassi kasutamist kaugküttes kui lokaalküttes.

Kaugküttega teenindatakse 56 miljonit ELi kodanikku, kellest 61% elab uutes liikmesriikides. Bulgaaria ja Rumeenia ühinemisel Euroopa Liiduga suureneb see arv veelgi. Konkureerides lokaalküttega seisab kaugküte probleemide ees. Paljud kaugküttesüsteemid vajavad tänapäevaseid seadmeid, infrastruktuuri ja juhtimist, et paraneksid nende kütusekasutus, kulutasuvus ja kasutusmugavus. Samuti on vaja teha süsteeme ümber biomasskütuse kasutamiseks. Komisjon julgustab kaugküttesüsteemide sellist arengut.

Komisjon soovitab tungivalt, et nõukogu nõustuks komisjoni ettepanekuga lisada kaugkütte tarned nende kaupade ja teenuste loetellu, mille suhtes liikmesriigid võivad rakendada käibemaksusoodustust.[22] Siis soovitaks komisjon liikmesriikidel laiendada kaugküttele neid käibemaksusoodustusi, mida juba kohaldatakse maagaasi või elektrienergia suhtes.

Komisjon võib ka esitada seadusandliku ettepaneku kaugkütet mõjutavate maksuküsimuste kohta. Komisjon uurib, kas samal ajal oleks vaja esitada ka muid meetmeid.

3. BIOMASSIST ELEKTRIENERGIA TOOTMINE

Elektrienergiat saab toota igat liiki biomassist ning seejuures on võimalik kasutada mitut tehnoloogiat (vt 6. lisa). Komisjon julgustab liikmesriike rakendama kõiki kulutasuvaid viise biomassist elektrienergia tootmiseks.

Taastuvatest energiaallikatest elektrienergia tootmist käsitleva direktiiviga on loodud raamistik biomassi kasutamiseks elektrienergia tootmisel.[23] Liikmesriigid on võtnud endale kohustuse saavutada taastuvenergia suhtes seatud eesmärgid. Enamikul juhtudel tundub nende saavutamine olevat võimatu, kui biomassi senisest rohkem ei kasutata.[24] Seepärast on

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19 Direktiiv 2002/91/EÜ ehitiste energiatõhususe kohta (EÜT L 1, 4.1.2003); vt 5. lisa.

20 Biomass võib olla suur saasteallikas, kui seda põletatakse ilma nõuetekohase kontrollita. Saaste võib tuleneda jäätmete ebaseaduslikust tuhastamisest või selliste biomassikatelde kasutamisest, kus põletamise kontroll ei ole piisav ja puuduvad saaste vältimise seadmed. Tänapäevased graanulikatlad ja kaugküttejaamad tekitavad palju vähem reostust.

21 Direktiiv 2005/32/EÜ, mis käsitleb raamistiku kehtestamist energiat tarbivate toodete ökodisaini nõuete sätestamiseks (ELT L 191, 22.7.2005).

22 Dokumendis KOM(2003)397; 23.7.2003.

23 27. septembri 2001. aasta direktiiv 2001/77/EÜ taastuvatest energiaallikatest toodetud elektrienergia kasutamise edendamise kohta elektrienergia siseturul (EÜT L 283, 27.10.2001).

24 Eelmise aasta teatises taastuvenergia osa kohta osutas komisjon, et elektritootmise kolme põhilise taastuvenergia allika hulgast on veejõu osa peaaegu staatiline, biomassi osa kasvab aeglaselt ning

kõnealuse direktiivi rakendamisel oluline osa, et arendada biomassi kasutamist elektrienergia tootmisel. Komisjon pöörab sellele ka edaspidi suurt tähelepanu.[25]

Elektri- ja soojuse koostootmisjaamades võib biomassist üheaegselt saada nii soojust kui ka elektrienergiat. Komisjon julgustab liikmesriike arvestama seda topeltkasu oma toetussüsteemides.

4. TRANSPORDIS KASUTATAVAD BIOKÜTUSED

4.1. Biokütuste direktiivi rakendamine

Nagu elektrienergia tootmise puhul, on ka selles sektoris nähtud ette raamistik ühenduse õigusaktiga – biokütuste direktiiviga,[26] milles on seatud kontrollväärtusteks biokütustele 2% suurune turuosa 2005. aastaks ning 5,75% suurune turuosa 2010. aastaks.[27]

2005. aastaks seatud kontrollväärtust ei saavutata. Liikmesriikide jõupingutused erinevad oluliselt;[28] kui kõik liikmesriigid täidavad enda seatud eesmärgid, oleks biokütuste osa vaid 1,4%.

Kõnealuse direktiivi rakendamiseks tuginevad paljud liikmesriigid kütuste maksuvabastustele.[29] Nende suhtes kehtivad riigiabi eeskirjad. Kooskõlas suunistega keskkonnakaitseks antava riigiabi kohta on komisjon võtnud saadud teadete suhtes üldiselt pooldava seisukoha. Siiski on tekkinud mitmeid praktilisi probleeme. Mitmed liikmesriigid on hiljuti hakanud rakendama biokütustega seotud kohustusi, nõudes kütuseid tarnivatelt äriühingutelt, et need kaasaksid turustatava kütuse hulka teatava protsendimäära ulatuses biokütuseid. Neid kahte lähenemisviisi on üksikasjalikumalt kirjeldatud 9. lisas. Biokütuse kasutamisega seotud kohustused tunduvad olevat paljulubav viis, et ületada raskused maksuvabastuste abil ning tagada, et eesmärkide saavutamine on kulutasuv. Ka hõlbustavad need teise põlvkonna biokütuste soodustamist, mida komisjon julgustab.

Vastavalt biokütuste direktiivile esitab komisjon 2006. aastal aruande kõnealuse direktiivi rakendamise kohta, pidades silmas selle võimalikku ülevaatamist. Kõnealune aruanne käsitleb järgmisi küsimusi:

- riikide eesmärgid biokütuste turuosa suhtes;
- biokütuste kasutamisega seotud kohustused;

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tuulejõu osa kasvab kiiresti. Kõnealuses direktiivis sätestatud eesmärkideni ei jõuta enne, kui biomassi osa hakkab kiiremini kasvama.

[25] Vt eraldi teatis, mis käsitleb toetuskavasid taastuvenergia kasutamiseks elektritootmises (KOM(2005) 627).

[26] 8. mai 2003. aasta direktiiv 2003/30/EÜ, millega edendatakse biokütuste ja muude taastuvkütuste kasutamist transpordisektoris (ELT L 123, 17.5.2003).

[27] Vt 7. lisa.

[28] Vt 8. lisa.

[29] Seda hõlbustab 27. oktoobri 2003. aasta direktiiv 2003/96/EÜ, millega korraldatakse ümber energiatoodete ja elektrienergia maksustamise ühenduse raamistik (ELT L 283, 31.10.2003).

- nõue, et sertifikaatide süsteemi alusel võetakse eesmärkide täitmisel arvesse ainult selliseid biokütuseid, mis vastavad säästva viljeluse miinimumstandarditele.[30]

Kõnealune sertifikaatide süsteem peaks kehtima mittediskrimineerivalt nii omamaiselt toodetud kui ka imporditud biokütuste suhtes.

4.2. Sõidukiturg

Komisjon esitab peatselt seadusandliku ettepaneku, millega julgustatakse riigihangete kaudu ostma keskkonnahoidlikke sõidukeid, mille hulka võiksid kuuluda suure biokütusesisaldusega segusid kasutavad sõidukid.[31]

Komisjon analüüsib praegu alternatiivsete kütuste kasutamise ulatust, sealhulgas biokütused, et arvestada kergeveokite CO_2 heitkoguste vähendamiseks seatud eesmärke, mis on osa ülevaatest, mis käsitleb ühenduse eesmärki saavutada keskmiseks heitkoguseks 120 g/km. 2006. aastal esitatav strateegia põhineb integreeritud lähenemisviisil. See tähendab, et lisaks autotootjate jõupingutusetele sõidukitehnoloogias võetakse arvesse meetmeid, nagu biokütuste kasutamine, maksusoodustused, tarbijate teavitamine ja liiklusummikute vältimine. Kõnealuse strateegia puhul arvestatakse autotööstuse tulevikustrateegiat, mis esitatakse samuti 2006. aastal.

4.3. Omamaise toodangu ja impordi tasakaalustamine

Biokütuste ja nende toorainetega kaubeldakse maailmaturgudel. Sõltumatu lähenemisviis ELi vajaduste rahuldamise suhtes ei ole võimalik ega ka soovitav. Sellest hoolimata on liidul teatav õigus otsustada, mil määral tuleks soodustada omamaist tootmist või importi. 10. lisas on kirjeldatud praegust olukorda bioetanoolikaubanduses. 11. lisas on hinnatud kolme viisi biokütuste 5,75% suuruse turuosa saavutamiseks:

– impordi osa minimeerimine;

– impordi osa maksimeerimine;

– tasakaalustatud lähenemisviis.

Komisjon eelistab tasakaalustatud lähenemisviisi. Seepärast toimib komisjon järgmiselt:

- esitab ettepaneku muuta standardit EN 14214, et hõlbustada suurema valiku taimeõlide kasutamist biodiislikütuse jaoks sellises ulatuses, kus seda on võimalik teostada ilma kütuse tehnilisi omadusi oluliselt mõjutamata;

- tegeleb biokütuste direktiivi muutmisega nii, et eesmärkide täitmisel võetakse arvesse ainult selliseid biokütuseid, mis vastavad säästva viljeluse miinimumstandarditele;

- säilitab imporditud bioetanoolile turulepääsutingimused, mis ei ole vähem soodsad võrreldes praegu kehtivate kaubanduskokkulepetega ettenähtud tingimustega;

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[30] Samuti uurib komisjon, kuidas saaks kohaldada säästva viljeluse miinimumstandardeid biomassi suhtes, mida kasutakse energiavaldkonnas muuks otstarbeks.

[31] Samuti on riigihangetel oluline osa teiste biomassiliikide edendamisel, eriti küttesektoris.

- püüdleb tasakaalustatud lähenemisviisi poole praegu peetavatel vabakaubanduslepete läbirääkimistel etanooli tootvate riikide/piirkondadega. EL peab austama riikide tootjate ja ELi kaubanduspartnerite huve seoses kasvava biokütusenõudlusega;

- toetab arengumaid, kes soovivad toota biokütuseid ja arendada välja oma siseturge. See on eriti oluline seoses suhkrureformidega.[32]

Komisjon tugineb nendele eesmärkidele kahepoolsetel läbirääkimistel (nt Mercosuriga) ja mitmepoolsetel läbirääkimistel (nt Maailma Kaubandusorganisatsiooni Doha läbirääkimistevoorus ja keskkonnahoidlike toodete kaubandust käsitleval arutelul).

4.4. Standardid

Kütusekvaliteedi direktiiviga[33] on kehtestatud bensiinis sisalduva etanooli, eetri ja teiste oksügenaatide piirmäärad. Sellega on piiratud ka bensiini aururõhk. Standardi EN 590 kohaselt ei tohi diislikütus sisaldada mahuliselt rohkem kui 5% biodiislit (energiasisaldus 4,6%). Need piirangud kitsendavad biokütuste kasutamise kasvu saavutamist.

Komisjon vaatab praegu läbi kütusekvaliteedi direktiivi. Komisjon hindab, millist mõju võiksid avaldada tegevusvõimalused eespool kirjeldatud küsimuste lahendamisel. Komisjon kaalub mitmesuguseid tegureid, arvestades kulusid ja kasu asjaomastes sektorites. Nende võimaluste läbivaatamisel arvestab komisjon muu hulgas:

– mõju tervisele ja keskkonnale (sealhulgas saasteainete ja kasvuhoonegaaside heitkogustele);

– mõju biokütuste direktiivis seatud eesmärkide saavutamisele ja nende saavutamise maksumusele.

4.5. Tehniliste tõkete kõrvaldamine

Biokütuste kasutamist takistavad tehnilised tõkked. Näiteks on tööstusettevõtjad väitnud, et:

– naftatorujuhtmete kaudu ei saa edastada etanooliga segatud bensiini;

– etanooliga otseseks segamiseks sobiva vähendatud aururõhuga toorbensiin ei ole otstarbekas.

Komisjon palub asjaomastel tööstusettevõtjatel neid tõkkeid tehniliselt põhjendada ning ootab ka muude huvitatud isikute seisukohti. Komisjon jälgib asjaomaste tööstusharude käitumist tagamaks, et biokütuseid ei diskrimineerita.

4.6. Etanooli kasutamine diislikütuse nõudluse vähendamiseks

Diiselsõidukite osa Euroopa sõidukipargis suureneb pidevalt. Siiski on Euroopa võimeline tootma rohkem bioetanooli kui biodiislikütust, kasutades vähem maad ning leides rohkem

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[32] Kõnealust aspekti käsitletakse üksikasjalikumat tulevases teatises biokütuste kohta.

[33] 13. oktoobri 1998. aasta direktiiv 98/70/EÜ bensiini ja diislikütuse kvaliteedi kohta (EÜT L 350, 28.12.1998), muudetud 3. märtsi 2003. aasta direktiiviga 2003/17/EÜ (ELT L 76, 22.3.2003).

võimalusi kulude vähendamiseks mastaabisäästude kaudu. Samuti on võimalik suurendada etanooli importi kolmandatest riikidest.

Komisjon julgustab etanooli kasutamist, et vähendada nõudlust diislikütuse järele, sealhulgas 95% etanooli kasutamist muudetud diiselmootorites. Standardi EN 14214 uuesti läbivaatamisel teeb komisjon ettepaneku kaaluda muudatust, mille kohaselt asendataks metanool biodiislikütuse tootmisel etanooliga.

5. VALDKONDADEVAHELISED KÜSIMUSED

5.1. Biomassiga varustamine

Eespool kirjeldatud meetmed sõltuvad piisava hulga biomassi kättesaadavusest. Käesolevas jaos pakutakse välja meetmed selle edendamiseks.

Ühine põllumajanduspoliitika

Ühise põllumajanduspoliitika 2003. aasta reform tähendab, et põllumajandustootjatele antav tulutoetus ei ole enam seotud nende saagiga. Selle tulemusel saavad põllumajandustootjad vabalt reageerida kasvavale nõudlusele energiakultuuride järele. Kõnealuse reformiga seati sisse ka energiakultuuride eritoetus[34] ning säilitati võimalus kasvatada toiduks mittekasutatavaid kultuure (sealhulgas energiakultuurid) maal, mis on kohustuslikult tootmisest kõrvaldatud. Komisjon esitab 2006. aastal nõukogule aruande energiakultuuride toetuse rakendamise kohta, millega koos esitatakse vajaduse korral ettepanekud, milles arvestatakse liidu eesmärke seoses biokütustega.

Varem toetati tootmisest kõrvaldatud maa süsteemi raames üksnes piiratud hulka energiakultuure. Selle reformiga sillutati teed põllumajandustootjate võimalusele kasvatada rohkem energiakultuure, sealhulgas lühikese raieringiga madalmetsa ja muid mitmeaastaseid kultuure. Otsuseid selle kohta, milliseid energiakultuure on asjakohane kasvatada, on kõige parem vastu võtta piirkondlikul või kohalikul tasandil. Komisjon rahastab teabekampaaniat energiakultuuride omaduste ning nendest tulenevate võimaluste kohta.[35] Teistsugust lähenemisviisi on vaja kiiresti kasvavate puuliikide puhul, sest siis on maa kasutamine põllumajandustootja jaoks mitmeks aastaks piiratud ning esimest saaki ei saa enne nelja aasta möödumist.

Metsandus

Ligikaudu 35% Euroopa Liidu metsade iga-aastasest puidu juurdekasvust jääb kasutamata.[36] Paljudes riikides on olemas vaid piiratud turg väikese suurusega harvendusraie puidule, mida saab kasutada soojuse ja elektrienergia tootmiseks. Enamik kasutamata ressursse on väikestes eravaldustes, mis muudab raskeks nende kasutuselevõtmise. Mõnes riigis on asutud seda probleemi lahendama olemasolevate tehastega liidetud turustusahelate loomisega ning logistikasüsteemide, metsaomanike koostöö ja transpordi korraldamise toetamisega. Komisjon

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[34] „Energiakultuuritoetus", mille alusel on võimalik saada energiakultuuride viljelemise eest toetust 45 eurot hektarilt, kusjuures selle toetuse maksmine on eelarve ülemmäära põhjal tagatud pindalalt kuni 1,5 miljonit hektarilt.

[35] See kampaania hõlmab ka metsandust.

[36] (Arvestamata kaitsealade metsi, nt Natura 2000 alad.)

püüab levitada nendest kogemustest saadud teadmisi ning toetada samalaadseid algatusi teistes riikides.

Komisjon koostab praegu metsanduse tegevuskava, mis võetakse vastu 2006. aastal; selles käsitletakse puidu energeetilisi kasutusviise.

Komisjon vaatab üle puidu ja puidujääkide energeetilise kasutamise mõju metsaga seotud tööstusharudele.

Jäätmed

Jäätmed on alakasutatud energiaressurss. Komisjon töötab praegu välja temaatilist strateegiat jäätmete tekkimise ärahoidmiseks ja ringlusse võtmiseks ning ettepanekut jäätmealaste raamõigusaktide uuesti läbivaatamiseks. Kaalumisel olevad võimalused hõlmavad:

- selliste jäätmehooldustehnikate edendamist, mis vähendavad jäätmete kütuseks kasutamisest tulenevat mõju keskkonnale;
- turupõhist lähenemisviisi ringlussevõtu ja taaskasutamise suhtes;
- tehniliste standardite edendamist selleks, et võimaldada taaskasutatavate materjalide käsitlemist kaubana (mis muudab lihtsamaks nende kasutamise energia tootmiseks);
- julgustamist investeeringuteks energiatõhusatesse tehnikatesse jäätmete kasutamiseks kütusena.

Loomsed kõrvalsaadused

Muuks otstarbeks kui inimtoiduks ettenähtud loomseid kõrvalsaadusi võetakse üha enam uuesti ringlusse energia saamiseks, eriti biogaasi ja biodiisli tootmises. Tehnoloogia ja teaduse edusammude tulemusel töötatakse pidevalt välja uusi tootmisprotsesse. Komisjon vaatab üle selliste protsesside lubamist reguleeriva raamistiku, et oleks võimalik avada uusi energiaallikaid, säilitades samas inimeste ja loomade tervise kaitse kõrge taseme.

Standardid

Kaubanduse hõlbustamiseks, turgude arendamiseks ja tarbijate kindlustunde suurendamiseks on vaja Euroopa standardeid tahkete biomasskütuste kohta. Euroopa Standardikomitee (CEN) tegeleb praegu nende standardite väljatöötamisega. Komisjon julgustab selle töö muutmist oluliseks prioriteediks.

Turustusahela täiustamine

Euroopa Liidu programmi „Arukas energeetika – Euroopa” toetuse abil on loodud Euroopa võimalused graanuli- ja laastukaubanduse jaoks. Kogused on väikesed. Komisjon uurib, kuidas saaks tulemusi parandada, võttes eesmärgiks kogu Euroopa Liitu hõlmava kauplemissüsteemi (kui seda saab tehniliselt ja majanduslikult teostada).

Riiklikud biomassi tegevuskavad

Riiklike biomassi tegevuskavadega saab vähendada investeerijate ebakindlust, hinnates eri biomassiliikide, sealhulgas puidu ja puidujääkide, samuti jäätmete ja põllumajanduskultuuride

füüsilist ja majanduslikku kättesaadavust, määrates kindlaks prioriteedid kasutatavate biomassiliikide ja nende arendamise viiside suhtes ning näidates meetmed, mida võetakse riikide tasandil selle edendamiseks. Samuti võivad sellised tegevuskavad olla seotud tarbijateabe kampaaniatega biomassi kasulikkuse kohta. Niisamuti saavad talitada piirkonnad. Komisjon julgustab riiklike biomassi tegevuskavade väljatöötamist.

5.2. Euroopa Liidu rahaline toetus biomassienergiale

Paljudel piirkondadel, mis saavad abi struktuuri- ja ühtekuuluvusfondidelt, on suur potentsiaal majanduskasvuks ja töökohtade loomiseks või stabiliseerimiseks biomassi abil. Seda eelkõige Kesk- ja Ida-Euroopa maapiirkondades. Väikesed tööjõukulud ja ressursside laialdane kättesaadavus võivad anda nendele piirkondadele võrreldes teistega eelise biomassi tootmisel. Seepärast on taastuvate ja alternatiivsete energiaallikate, nagu biomassi tootmine, toetamine struktuuri- ja ühtekuuluvusfondide oluline prioriteet, nagu on märgitud komisjoni ettepanekus ühenduse ühtekuuluvuspoliitika strateegiliste suuniste kohta.[37] Kõnealused fondid võivad toetada põllumajandustootjate ümberõpet, seadmete hankimist biomassi tootjatele, investeeringuid biokütuste ja muude materjalide tootmisrajatistesse ning elektri- ja kaugküttetootjate ümberlülitumist biomassile.

Komisjon kutsub liikmesriike ja piirkondi tagama oma riiklike strateegiliste raamistike ja tegevusprogrammide koostamisel seda, et biomassist tulenevat võimalikku kasu on põhjalikult arvesse võetud.

Maaelu arendamise poliitika kaudu saab toetada põllumajandusettevõtetesse või nende lähedale tehtavaid investeeringuid, aga ka kasutamata biomassi kasutuselvõtmist metsaomanike poolt. Komisjon on pakkunud välja ühenduse maaelu arendamise strateegilised suunised, milles pööratakse suurt tähelepanu taastuvenergiale üldiselt ja eriti biomassi turustusahelatele.[38] Komisjon julgustab liikmesriike kasutama neid võimalusi maapiirkondade majanduse arendamiseks ja mitmekesistamiseks riiklike maaelu arenguprogrammide kaudu. Komisjon teeb ettepaneku asutada eritöörühm, mis kaaluks biomassiga seotud võimalusi nende programmide raames.

5.3. Riigiabi

Ametlik toetus biomassi tootmiseks ja kasutamiseks peab vastama ühenduse riigiabipoliitikale. Komisjon saab lubada investeeringutoetust ja tegevusabi vastavalt ühenduse suunistele keskkonnakaitseks antava riigiabi kohta.[39] Nendes suunistes sisalduvates reeglites on arvesse võetud biomassist toodetud energia võimalikku kasulikku mõju võrreldes energia tootmisega fossiilkütustest. Toetatavatel aladel antavat investeeringutoetust võidakse käsitleda kui ühisturuga kokkusobivat vastavalt piirkondliku riigiabi andmise suunistele.[40] Lubamatuid konkurentsimoonutusi ei tohiks esineda. Vt ka 9. lisa.

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37 KOM (2005) 299, 5.7.2005
38 KOM (2005) 304.
39 EÜT C 37, 3.2.2001, lk 3.
40 EÜT C 74, 10.3.1998, lk 9.

6. UURIMISTEGEVUS

Komisjoni seitsmenda raamprogrammi ettepanekus on biomassi tootmisele pööratud suurt tähelepanu. Kõnealune ettepanek hõlmab mitut meedet seoses biomassiga:

- „biomass kütuste, elektrienergia, soojuse ja jahutuse tarvis", et töötada välja tehnoloogiate kogum ja tutvustada seda;
- „intelligentsed energiavõrgud", sealhulgas biomassikäitiste integreerimine elektrivõrkudesse ning maagaasivõrgu toitmine bio- ja tehisgaasiga;
- „bioteadused ja biotehnoloogia säästvate toiduks mittekasutatavate toodete ja protsesside jaoks", sealhulgas biotehnoloogia kasutamine biomasstoorainete produktiivsuse, jätkusuutlikkuse ja koostise täiustamiseks ning uute bioprotsesside väljatöötamiseks.

Mõned kõige olulisemad töövaldkonnad on:

- tööstusharude juhitava „biokütuste tehnoloogilise platvormi" väljatöötamine;
- „bio-rafineerimistehaste" kontseptsioon, milles leitakse kasutusviisid kõikidele taimeosadele;
- teise põlvkonna biokütuste uurimine, milles oodatakse ühenduse rahastamise olulist suurendamist.

Komisjon kaalub, kuidas saaks kõige paremini arendada põllumajanduskultuuride ja metsataimede optimeerimise ja muundamisega seotud uurimistegevust energeetikavaldkonnas.

Programmi „Arukas energeetika – Euroopa" kaudu toetab komisjon uuringute käigus tõestatud tehnikate levitamist.

Üksikasjalikum teave on esitatud 12. lisas.

7. JÄRELDUS

Euroopa peab lõpetama oma sõltuvuse fossiilkütustest. Biomass on üks peamisi alternatiive. Euroopa tasandil on vaja välja töötada kulutasuvaid meetmeid biomassi kasutamise edendamiseks, et:

- saada maksimaalset kasu uuendustest nii riigi kui ka kohalikul tasandil;
- pakkuda selget tulevikusuunda suurematele tööstusharudele, mis on organiseerunud üle Euroopa;
- jagada koormust õiglaselt.

Käesolevas teatises on esitatud ühenduse kooskõlastatud tegevusprogramm, mis hõlmab meetmeid biomassinõudluse edendamiseks, varustamise parandamiseks, tehniliste tõkete ületamiseks ja uurimistegevuse arendamiseks.

Kõnealust tegevuskava on välja töötatud ligi aasta. See tugineb laiaulatuslikele nõupidamistele huvitatud isikutega.[41] Nende vastus ideele töötada selles valdkonnas välja jõuline ühenduse lähenemisviis on olnud suuresti ja sageli üksmeelselt toetav. Järgmine samm on see programm ellu viia. Järgmisel kevadel esitatav roheline raamat käsitleb tehtud edusamme ja edasist arengut Euroopa ühtse energiapoliitika kohta.

[41] Vt 13. lisa.

LISA 1 – Biomass action plan: summary of measures

Biomass for heating and electricity

The Commission will:

- work towards a proposal for Community legislation in 2006 to encourage the use of renewable energy, including biomass, for heating and cooling;
- examine how the directive on energy performance of buildings could be amended to increase incentives for the use of renewable energy;
- study how to improve the performance of household biomass boilers and reduce pollution, with a view to setting requirements in the framework of the eco-design directive;
- encourage district heating scheme owners to modernise them and convert them to biomass fuel;
- encourage Member States that apply a reduced VAT rate to gas and electricity to apply such a rate to district heating too;
- pay close attention to the implementation of the directive on electricity from renewable energy sources;
- encourage Member States to harness the potential of all cost-effective forms of biomass electricity generation;
- encourage Member States to take into account, in their support systems, the fact that, in combined heat and power plants, biomass can provide heat and electricity at the same time.

Transport biofuels

The Commission will:

- Bring forward a report in 2006 in view of a possible revision of the biofuels directive. This report will address the issues of:
  - setting national targets for the share of biofuels;
  - using biofuels obligations on fuel suppliers;
  - ensuring, through certification schemes, that the biofuels used to meet the targets satisfy minimum sustainability requirements.
- Encourage Member States to give favourable treatment to second-generation biofuels in biofuels obligations.
- Bring forward a legislative proposal promoting public procurement of clean and efficient vehicles, including those using high blends of biofuels.

- Examine how biofuel use can count towards the CO_2 emission reduction targets for car fleets.

- Pursue a balanced approach in ongoing free trade agreement negotiations with ethanol-producing countries/regions. The EU must respect the interests of domestic producers and EU trading partners, within the context of rising demand for biofuels.

- Propose amendments to the "biodiesel standard" to facilitate the use of a wider range of oils, including imported oils, to produce biodiesel, and allow ethanol to replace methanol in biodiesel production.

- Assess the impact of options to address the issues of limits on the content of ethanol, ether and other oxygenates in petrol; limits on the vapour content of petrol; and limits on the biodiesel content of diesel.

- Ask the relevant industries to explain the technical justification for practices that act as barriers to the introduction of biofuels and monitor the behaviour of these industries to ensure that there is no discrimination against biofuels.

- Support developing countries by helping them to produce biofuels and by maintaining market access conditions that are no less favourable than those provided by the trade agreements currently in force.

- Bring forward a communication dealing specifically with biofuels early in 2006.

Cross-cutting issues

The Commission will:

- Assess the implementation of the energy crop scheme.

- Finance a campaign to inform farmers and forest holders about the properties of energy crops and the opportunities they offer.

- Bring forward a forestry action plan in which energy use of forest material will play an important part.

- Review the impact of the energy use of wood and wood residues on forest based industries.

- Consider how the waste framework legislation could be amended to facilitate the use of clean wastes as fuel.

- Review how the animal by-products legislation could be amended in order to facilitate the authorisation and approval of alternative processes for the production of biogas and other biofuels

- Encourage the European Committee for Standardisation to speed up work on standards for the quality of biomass fuels.

- Explore how to develop a European spot market in pellets and chips.

- Encourage Member States to establish national biomass action plans.

Encourage Member States and regions to ensure that the benefits of biomass are taken into account when preparing their national reference frameworks and operational plans under the cohesion policy and the rural development policy.

Research

The Commission will:

- Continue to encourage the development of an industry-led "Biofuel technology platform".

- Consider how best to take forward research into the optimisation of agricultural and woody crops for energy purposes, and biomass to energy conversion processes.

- Give a high priority to research into the "bio-refinery" concept, finding valuable uses for all parts of the plant.

- Give a high priority to research into second-generation biofuels, with an aim of improving their efficiency and cost-effectiveness; a substantial increase in Community funding is expected.

LISA 2 – EU biomass production potential

The table assesses the EU's potential to produce biomass for energy use. These estimates are conservative because they are based on the following assumptions:

- no effect on domestic food production for domestic use;
- no increase in pressure on farmland and forest biodiversity;
- no increase in environmental pressure on soil and water resources;
- no ploughing of previously unploughed permanent grassland;
- a shift towards more environmentally friendly farming, with some areas set aside as ecological stepping stones;
- the rate of biomass extraction from forests adapted to local soil nutrient balance and erosion risks.

The first column of the table shows the quantities of EU-produced biomass used for energy purposes today. The following columns show the potential contribution in 2010, 2020 and 2030. The potential for 2010 is 2½ times the contribution today. The potential for 2020 is 3 to 3½ times the contribution today, and the potential for 2030 is 3½ to 4½ times that of today. Forests, wastes and agriculture all make a big contribution to this potential for growth. The increase from forestry comes from an increase both in fellings and in the use of residues. The increase from agriculture is driven by the reform of the common agricultural policy.

EU biomass production potential[42]

Mtoe	**Biomass consumption, 2003**	**Potential, 2010**	**Potential, 2020**	**Potential, 2030**
Wood direct from forest (increment and residues)	67[43]	43	39-45	39-72
Organic wastes, wood industry residues, agricultural and food processing residues, manure		100	100	102
Energy crops from agriculture	2	43-46	76-94	102-142
TOTAL	**69**	**186-189**	**215-239**	**243-316**

[42] Sources: 2003 data from Eurostat; projections for 2010, 2020 and 2030 from European Environmental Agency, "How much biomass can Europe use without harming the environment", briefing 2/2005

[43] This figure includes 59 Mtoe of wood and wood wastes; 3 Mtoe of biogas; and 5 Mtoe of municipal solid waste.

It should be underlined that due to lack of data, this table only covers the EU25. It does not include the contribution of Bulgaria and Romania. These countries will be EU members by 2010, and have high biomass production potential. Nor does the table include imports. Most regions of the world have higher potential to produce biomass, relative to their energy consumption, than the EU. Potential EU consumption is therefore significantly higher than these figures would suggest.

LISA 3 – A scenario to increase biomass energy using current technologies

mtoe	**Current (2003)**	**Future (2010)**	**Difference**
Electricity	20	55	35
Heat	48	75	27
Transport	1	19	18
TOTAL	69	149	80

This scenario is drawn from the 2004 communication "The share of renewable energy", expanded to the EU25. It is compatible with achievement of the Community's targets of: a 12% overall share of renewable energy; a 21% share of renewable energy in electricity generation; and a 5.75% market share for biofuels.

The Commission believes this scenario can be achieved in the three sectors sectors – electricity, heat and transport – through the measures in this action plan – if not in 2010, the year for which these targets were set, then within a year or two of that date.

This is the scenario that serves as the basis for the impact assessment on this communication.

LISA 4 – Environmental impacts

Biomass has three main environmental impacts:

- Avoidance of greenhouse gas emissions

  The Commission estimates that the scenario in Annex 3, if achieved, would reduce greenhouse gas emissions by 209 million tonnes of $CO_{2\text{-eq}}$ per year.

- Environmental impact of the production of raw materials

  Agriculture can have significant effects on the environment, positive and negative. In general, the level of harmful effects varies with the intensity of the agriculture. This is true whether crops are used for food or energy purposes. It can be particularly harmful to bring previously uncultivated land (permanent grassland) into agricultural use.

  On the other hand, using grass cuttings from such land for biomass production can help to prevent the decline of biodiversity on species-rich grasslands due to land abandonment.

  Energy crop cultivation can help to improve the overall profitability of the farm business, contributing to the maintenance of farming in areas where this may be useful from an environmental (or wider sustainable development) perspective. This is important in a number of regions to improve soil stability and prevent irreversible landslide damage. Another potential positive aspect of energy crop production is its contribution to the establishment of new crop rotation systems that are more advantageous from a wider environmental point of view (for example, alternatives to the monoculture of maize).

  If energy crops are grown on agricultural land that was previously used for food production, the change in environmental pressure depends on which biomass crops are cultivated.

  The plantation of tree crops to enhance soil cover on degraded land can also have a globally positive impact. However this should not take place on steppic or mountain habitats that have a high biodiversity value.

  The use of wastes and residues for energy purposes often gives an environmental bonus compared with other means of disposal. For forest residues, the environmental impact depends on the local soil nutrient balance and the risk of erosion, which may require a certain amount of the residues (especially foliage) to be left on site. In some regions, however, their extraction help to reduce the risk of fire.

- Environmental impact of the use of biomass

  Like fossil fuels, biomass emits pollutants. Advanced emission control equipment can virtually eliminate this, however. Such equipment is already standard in transport and, increasingly, in electricity generation. The situation is less favourable with heating, particularly home heating.

This analysis points to two priorities:

- the need to guarantee that site-specific environmental requirements are observed when producing biomass – this will be addressed in the Commission's 2006 report on the implementation of the biofuels directive

- improving the pollution performance of household biomass burning – this will be addressed as part of the measures proposed in this action plan to develop biomass heating.

The Commission will also take steps to improve understanding of the costs and environmental impacts of all transport fuels, including conventional biofuels.

LISA 5 – Renewable energy and the directive on the energy performance of buildings

The directive on the energy performance of buildings[44] requires Member States, when calculating the energy performance of buildings, to take into account the positive influence of "heating and electricity systems based on renewable energy sources". The relative importance attached to different kinds of renewable energy will be decided by the Member States in their transposition of the directive, allowing them, in principle, to attach substantial premia to the use of biomass in their calculation methods.

Moreover, for new buildings larger than 1000 square meters, Member States are required to carry out technical, environmental and economic feasibility studies on the use of decentralised energy supply systems based on renewable energy, on CHP and on district or block heating or cooling. This also gives Member States considerable leeway to promote biomass. In many Member States, biomass heating is one of the most practical and cost-effective options.

During 2006, taking into account comments received on the energy efficiency Green Paper[45], the Commission will decide how it thinks the directive should be further developed. The possibilities it will consider could include:

- amending the annex to the directive to ensure that calculation procedures allow greater weight and more active promotion to be given to biomass heating and other forms of renewable energy;

- reducing the thresholds in the directive so that many more new buildings would have to be considered for renewable energy before construction starts, and many more renovation projects would need to meet minimum efficiency requirements based on energy performance calculations that include the positive influence of renewable energy sources, including biomass;

- setting EU-wide minimum energy performance standards and criteria that could also promote the use of biomass where it is technically feasible and economically interesting.

At the same time, the Commission will examine other options for development of the directive, including *inter alia* the use of energy-efficient building materials.

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44 Directive 2002/91 of the European Parliament and of the Council of 16 December 2002 on the energy performance of buildings, O.J. L1, 4/01/2003

45 COM(2005)265 final of 22/06/2005

LISA 6 – Biomass for electricity generation

Electricity can be generated from all types of biomass. Several reliable technologies are available. These technologies can be used to "co-fire" biomass, by mixing it with coal or natural gas, or to run freestanding power stations.

Large centralised power plants, like those used to burn straw in Denmark or forest residues in Finland, offer the best economic performance, especially if they are also used for heat (combined heat and power, CHP). Co-firing biomass with coal is another good centralised option in existing large power plants.

It is more efficient, when electricity is generated from biomass, to make use of the heat that is produced as well. Member States can support this in the design of support schemes for electricity generated from renewable energy sources, or through CHP support schemes developed in accordance with the harmonised European efficiency reference values for CHP which will come into force in February 2006 in accordance with the CHP directive[46].

Smaller decentralised plants burning solid biomass or biogas tend to cost more, but often have advantages for the environment and for rural development. The EU structural funds or its rural development programme can be used to study their optimal location in relation to biomass availability, transport infrastructure, grid connection possible and labour markets.

The Commission encourages Member States to harness the potential of all cost-effective forms of biomass electricity generation rather than focusing on one form alone.

[46] Directive 2004/8 of the European Parliament and of the Council of 11 February 2004 on the promotion of cogeneration based on a useful heat demand in the internal energy market and amending Directive 92/42/EEC, O.J. L52, 21/02/2004

LISA 7 – Transport biofuels: background

In 2001 the Commission adopted a communication on alternative fuels for road transport, identifying three fuels (biofuels, natural gas and hydrogen) that could play a big part[47]. It was accompanied by legislative proposals requiring Member States to promote biofuels and making it easier to use fuel tax exemptions to do this. These proposals were adopted, in amended form, in 2003[48].

Since the adoption of the communication the market share of biofuels has increased from 0.2% in 2000 to 0.8% in 2004. About 90% of biofuel consumption is covered by domestic raw materials, 10% by imports. Out of the EU25's total arable land of 97 million hectares, about 1.8 million hectares were used for producing raw materials for biofuels in 2005. As expected, there has been a shift towards low blends and away from the high blends or pure biofuels that prevailed in 2001. Biodiesel's share of total biofuel consumption has stayed at 70 to 80%.

The rise in the oil price and a growing interest in new markets for agricultural products in the light of the reform of the common agricultural policy - and the sugar regime in particular - have led to a wider appreciation of biofuels' advantages at European level and have provoked widespread discussion in Member States.

"Second-generation" biofuels from wood and wastes are currently more expensive than first-generation biofuels from agricultural crops and have not yet been fully demonstrated on a commercial scale. Once that has been achieved, they will widen the range of raw materials that can be used and could also further improve biofuels' environmental profile. It should be underlined, however, that first-generation biofuels already offer significant benefits and that any significant contribution from second-generation biofuels will not materialise until after 2010. Therefore, the emphasis of this action plan is on first-generation biofuels.

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47 COM (2001) 547

48 Directive 2003/30/EC of the European Parliament and of the Council of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport, O.J. L123, 17/05/2003, and Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity, O.J. L283, 31/10/2003

LISA 8 – Biofuels: progress at national level

Member State	Market share 2003	National indicative target for 2005	Targeted increase, 2003-2005
AT	0.06%	2.5%	+2.44%
BE	0	2%	+2%
CY	0	1%	+1%
CZ	1.12%	3.7% (2006)	+ 1.72% (assuming linear path)
DK	0	0%	+0%
EE	0	2%	+2%
FI	0.1%	0.1%	+0%
FR	0.68%	2%	+1.32%
DE	1.18%	2%	+0.82%
GR	0	0.7%	+0.7%
HU	0	0.4-0.6%	+0.4-0.6%
IE	0	0.06%	+0.06%
IT	0.5%	1%	+0,5%
LA	0.21%	2%	+1.79%
LI	0 (assumed)	2%	+2%
LU	0 (assumed)	not yet reported, assume 0	not yet reported
MT	0.02%	0.3%	+0.28%
NL	0.03%	2% (2006)	+0% (promotional measures will come into force from January 2006)
PL	0.49%	0.5%	+0.01%
PT	0	2%	+2%
SK	0.14%	2%	+1.86%
SI	0 (assumed)	0.65%	+0.65%
ES	0.76%	2%	+1.24%
SV	1.32%	3%	+1.68%
UK	0.03%	0.3%	+0.27%
EU25	**0.6%**	**1.4%**	**+0.8%**

Sources

2003: National reports under the biofuels directive except Belgium: Eurostat (figure for 2002) and Italy: EurObserv'Er

2005: National reports under the biofuels directive.

National reports under the biofuels directive are available at http://europa.eu.int/comm/energy/res/legislation/biofuels_en.htm

LISA 9 – Implementing the biofuels directive: fuel tax exemptions and biofuel obligations

Member States are using two main tools to implement the Biofuels Directive: tax exemptions and biofuels obligations.

Tax exemptions

Member States make a good deal of use of fiscal policy to promote biofuels. The energy taxation directive establishes the framework for the consequent tax exemptions.

Under Article 16 of this directive, Member States can reduce taxes on biofuels or completely exempt them from taxes, without needing the Commission's prior approval (on fiscal grounds), as long as they respect certain strict conditions.

The tax reduction or exemption cannot exceed the amount of tax which would otherwise be payable on the volume of biofuel present in the product that is eligible for the reduction. In addition, it should be emphasised that the tax reductions or exemptions introduced by Member States must be modified in line with changes in the price of raw materials, in order to ensure that the reductions do not lead to overcompensation of the additional costs of biofuel production. The fiscal advantage (exemption or reduction) granted to a fuel of renewable origin cannot exceed the difference between this fuel and an equivalent fossil fuel.

These fiscal measures no longer need the prior, unanimous approval of other Member States. However, they remain subject to state aid control. The Commission has taken a generally favourable attitude to the notifications received. The exemptions that have received state aid approval are listed in the table.

Table - Biofuel tax exemptions that have received state aid approval

Case	Biofuels concerned	reference
C64/2000 FR	ETBE	OJ L 94 of 10.4.03, p.1
N461/01 IT	Biodiesel	OJ C 146 of 19.6.02,p.6
N480/02 SE	All CO2-neutral fuels	OJ C 33 of 6.2.2004, p.7
N804/01 UK	Biodiesel	OJ C 238 of 3.10.02, p.10
N512/02 SE	Biofuel pilot projects	OJ C 75 of 27.3.03, p.2
N685/02 DE	Bioethanol, biodiesel and vegetable oils	OJ C 86 of 6.4.04, p.15
N717/02 IT	Bioethanol and ETBE	OJ C 16 of 22.1.04, p.22
N407/03 UK	Bioethanol	OJ C 193 of 28.4.05, p.17
NN43/04 AT	Bioethanol, biodiesel and vegetable oils	Not published yet
N187/04 SE	Biofuel pilot projects	Not published yet
N206/04 CZ	Biodiesel	Not published yet
N427/04 HU	Biodiesel and ETBE	OJ C133 of 31.5.05, p.2
N582/04 IT	Biodiesel (prolongation of N461/01)	Not published yet
N599/04 IRL	Biodiesel, bioethanol and vegetable oils	OJ C 98 of 22.4.05, p.10
N44/05 LT	Biodiesel, bioethanol, vegetable oils and ETBE	Not published yet
N223/05 CZ	Biodiesel	Not published yet
N314/05 EE	Bioethanol, biodiesel and vegetable oils	Not published yet

All decisions not to raise objections can be found on the Commission's website: http://europa.eu.int/comm/secretariat_general/sgb/droit_com/index_en.htm#aides

However, the Commission is aware that the system of tax exemptions, as implemented, is giving rise to three problems:

1) The risk of **unnecessarily high cost to the state and unnecessarily high payments to undertakings**. Biofuels producers have different costs but, under the tax exemption system, all receive the same level of compensation. If the level of compensation is enough to bring high-cost producers into the market, there is a risk that it overcompensates lower-cost producers. The risk of overcompensation appears to be widespread, both within the Community and internationally. The services of the Commission are presently looking into several possibilities, including the limitation of detaxation to undenatured bioethanol (which is subject to the highest import duty) and/or making the rate of detaxation depend on the raw material used.

2) Insufficient **investor certainty**. The Energy Taxation Directive limits the duration of tax exemptions to six years. Among the schemes adopted to date, only the French scheme lasts as long as this. In general, Member States could consider taking coordinated measures to create a stable investment climate, in particular by making full use of the possibility under Community law to adopt six-year tax reliefs and to arrange for their extension well before the term has expired. However, stakeholder consultation has clarified that even this period of certainty is less than needed for some investments, particularly in second-generation biofuels but also in first-generation ethanol plants.

3) While some Member States use open aid schemes, available to all, others have opted for a **quota-based approach**, limiting the quantity of biofuel that will qualify for the tax exemption and setting up a process to choose the firms that will benefit from it. The Commission sees risks of non-transparency, arbitrary allocation and increased market concentration in quota-based schemes.

Biofuels obligations

At present there is increasing interest among Member States in the use of **biofuel obligations**, requiring fuel supply companies to incorporate a given percentage of biofuels in the fuel they place on the national market or face a penalty[49]. Obligations are in force in France and Austria and will come into force in Slovenia in 2006 and in the Czech Republic and the Netherlands in 2007. The UK and Germany have recently said that they will introduce them. Schemes vary in relation to: the point in the distribution chain where the obligation is placed; whether individual types of biofuel are distinguished; how compliance is monitored; whether they are implemented through a system of tradable certificates; and whether they coexist with fuel tax exemptions.

Obligations have a number of advantages. They place responsibility for addressing the problem of excessive oil dependence on the sector where it originates – while implying only a negligible increase in the cost of fuel. They give fuel supply companies an incentive to push

[49] Obligations that take this form are compatible with the Fuel Quality Directive (Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC (O.J. L350, 28/12/1998), as amended by Directive 2003/17/EC of the European Parliament and of the Council of 3 March 2003 (O.J. L76, 22/03/2003)). By contrast, an obligation to incorporate a given proportion of biofuel in each litre of fuel sold would not be compatible with the Directive..

down the cost of biofuels – and it follows that they are more cost-efficient. They can include a premium for second-generation biofuels. Unlike state aids, they are not subject to a time limit and so could be a good way to establish the stable framework that investors want.

Compatibility between obligations and exemptions

It is important to point out that Article 16.6 of the energy taxation directive states that if Community law requires Member States to comply with legally binding obligations requiring them to place a minimum proportion of biofuels, the option for Member States to reduce excise duties under fiscal control (that is, without needing specific authorisation from the Council under unanimity) would disappear.

LISA 10 – Trade in bioethanol

1. Current trade in bioethanol

There is currently no specific customs classification for bioethanol for biofuel production. This product is traded under code 22 07 which covers both denatured (CN 22 07 20) and undenatured alcohol (CN 22 07 10). Both denatured and undenatured alcohol can then be used for biofuel production. It is not possible to establish from trade data whether or not imported alcohol is used in the fuel ethanol sector in the EU.

An import duty of €19.2/hl is levied on undenatured alcohol, while an import duty of €10.2/hl applies to denatured alcohol.

Table I

Imports under code 2207 (in hl)			
	Av. 1999-2001	**Av. 2002-04**	**% of total (02-04)**
Undenatured alcohol	1 167 935	2 383 239	93%
Denatured alcohol	279 904	180 988	7%
Total	1 447 839	2 564 226	100%

Overall imports of alcohol under code 2207 averaged 2 564 226 hl over the 2002-04 period, up from 1 447 839 hl over 1999-2001. Over 93% of them came under code 22 07 10 (undenatured alcohol).

The principal trade trends are summarised in Table II:

Table II

Total imports of alcohol under code 22 07 (in hl) by type of duty					
	2002	**2003**	**2004**	**Av. 2002-04**	**% of total**
Reduced duty	227 285	182 940	288 364	232 863	9%
Duty-free	980 693	2 027 632	1 709 282	1 572 536	61%
MFN	657 011	494 771	1 124 699	758 827	30%
TOTAL	1 864 989	2 705 344	3 122 345	2 564 226	100%

a) average imports of bioethanol increased by 77% over 2002-2004 compared to the previous three-year period (1999-2001) when they totalled 1 447 839 hl;

b) over that period 70% of these imports were traded under preferential conditions, out of which almost 61% were duty-free, while 9% benefited from some type of duty reduction;

c) 30% of EU trade under code 22 07 takes place under MFN (most favoured nation) conditions.

With respect to the largest exporting countries:

a) over the 2002-2004 period, Pakistan was the largest duty-free exporter with an average of 501 745 hl followed, at a distance, by Guatemala with 223 782 hl;

b) Brazil is the only country capable of exporting large quantities as MFN with an average of 649 640 hl over the same period, with the second MFN exporter, the USA, on only 20 109 hl;

c) one country - Ukraine - accounts for the vast majority of imports at reduced duty with 107 711 hl over the 2002-04 period. Egypt came second with over 43 000 hl.

2. Preferential imports of bioethanol into the EU

The EU's preferential trade basically comes under two regimes: the Generalised System of Preferences (including, among others, the Everything But Arms (EBA) initiative) and the Cotonou Agreement. The main preferences accorded by each of them are summarised in Table III and described in detail in the following sections.

Table III

Import conditions under code 22 07 under EU's main preferential agreements					
	GSP normal		**GSP+**	**EBA**	**Cotonou**
Duty reduction	15% up to 31.12.2005	0% as of 1.1.2006	100%	100%	100%
Quantitative restrictions	NO		NO	NO	NO
Beneficiaries	All GSP beneficiaries if not graduated.		Bolivia, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Panama, Peru, El Salvador, Venezuela, Georgia, Sri Lanka and Mongolia	LDCs	ACPs

2.1. GSP

The current Council Regulation (Regulation (EC) 2501/2001), in force until 31 December 2005, classifies denatured and undenatured alcohol under code 22 07 as a sensitive product, According to article 7.4 of the regulation, imports of this alcohol from all GSP beneficiary countries qualify for a 15% reduction of the MFN duty[50].

Under the special drugs regime envisaged by Council Regulation (EC) 2501/2001, which was in force from the early nineties until repealed on - 30 June 2005, exports from a number of countries (Bolivia, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Nicaragua, Panama, Peru, Pakistan, El Salvador and Venezuela) qualified for duty-free access under code 22 07.

[50] Article 7(4) of Council Regulation (EC) No 2501/2001 of 10.12.2001.

The new GSP Regulation (Council Regulation (EC) No 980/2005 of 27.06.2005), which will apply from 1 January 2006 to 31 December 2008, no longer envisages any tariff reduction for either denatured or undenatured alcohol under code 22 07 (still classified as a sensitive product). This Regulation put in place a special incentive arrangement for sustainable development and good governance (the new GSP + incentive scheme) which has been applying on a provisional basis since 1 July 2005 and will apply on a permanent basis from 1 January 2006 to 31 December 2008. This new incentive arrangement grants unlimited and duty free access (suspension of Common Customs Tariff duties) to denatured or undenatured alcohol under code 2207. It includes all the countries which already benefited from the previous drugs scheme, with the exception of Pakistan which is subject to the full MFN duty.

The new incentive arrangement now also includes Georgia, Sri Lanka and Mongolia, which have not so far exported bioethanol to the EU.

Moreover, a special arrangement for least developed countries (the EBA initiative) provided for by the new GSP Regulation offers an unlimited duty-free access to denatured or undenatured alcohol under code 2207.

2.2. Cotonou Agreement

Under the Cotonou Agreement, ACP countries qualify for duty-free access for denatured and undenatured alcohol under code 22 07 with the sole exception of South Africa. According to Regulation (EC) 2501/2001, South Africa enjoys a 15% reduction in customs duties. From 1 January 2006 it will therefore have to pay full MFN duty. During the ongoing European Partnership Agreement (EPA) negotiations with ACP countries, the customs duties of alcohol under code 22 07 will need to be negotiated.

2.3. Other countries with preferential arrangements

Egypt currently has unlimited duty-free access to the EU under the Euro-Mediterranean Agreement. Before that, it qualified for a 15% reduction under the GSP scheme.

Norway, which ranks among the top ten exporters with a total of 89 375 hl under code 22 07 in 2004, has been granted duty-free access to the EU within the framework of tariff rate quotas (TRQs) since the mid-nineties. In 2005 the TRQ will total 164 000 hl for exports under code 22 07 10 (up from 134 000 hl the previous year) and 14 340 hl under code 22 07 20, up from 3 340 hl.

3. Trade analysis

Table IV sums up trade under the various preferential arrangements.

Table IV

Imports under preferential conditions 2002 – 2004 (in hl)					
	2002	**2003**	**2004**	**Av. 2002-04**	**% of total trade 2002-04**
GSP normal	227 285	182 940	288 364	232 863	9%

GSP +	553 156	1 569 005	1 412 896	1 178 352	47.5%
ACP	291 055	268 784	154 663	238 167	9%
EBA	30 018	86 247	18 956	45 074	1.5%
Others	106 464	103 597	122 768	110 943	4%
Total preferential	1 207 978	2 210 573	1 997 646	1 805 399	70%
Total MFN	657 011	494 771	1 124 699	758 827	30%
Grand total	1 864 989	2 705 344	3 122 345	2 564 226	100%

3.1. GSP

Trade data for 2001–2004 show a dramatic increase in bioethanol exports from the countries benefiting from the special drugs regime in previous years. Although these countries have benefited from the same regime since the 1990s, the unlimited duty-free access enjoyed under it at a moment of rising demand for alcohol under code 22 07 can be considered the single most important factor underlying the doubling of bioethanol exports from these countries to the EU. All major exporters under code 22 07 over the last three years benefit from such a scheme: Pakistan, Guatemala, Peru, Bolivia, Ecuador, Nicaragua and Panama.

Altogether, exports of ethanol from the GSP plus beneficiaries totalled 1 412 896 hl in 2004: practically all duty-free exports to the EU and 46% of all exports under code 22 07 to the EU over the 2002-2004 period.

Thanks to its lower production costs, Pakistan took a big lead over the other GSP beneficiaries with 1 008 656 hl in 2004 (the second largest exporter in the world) followed, at a distance, by Guatemala with over 250 000 hl.

Under the new GSP an exclusion of Pakistan from the list of countries having unlimited duty-free access to the EU market, will remove from the market one of the most aggressive and competitive producers. All old direct competitors under the GSP drugs regime will continue to enjoy duty-free access to the EU market and might be expected to fill the gap left by Pakistan as they have relatively low production costs too.

Nevertheless, at US$14.52/hl, Pakistan has production costs closer to Brazil's which, with production costs of US$13.55/hl, manages to export substantial quantities to the EU paying the full MFN duty. Pakistan might therefore be expected to continue to be able to export significant quantities of ethanol to the EU, albeit not at the same pace as before, thus utilising the increased production capacity built over the last couple of years.

By contrast, the 15% reduction offered by the normal GSP regime opened access for approximately 9% of exports of the same product to the EU market. Unlike the obvious favourable impact of the GSP drugs regime, the impact of the 15% duty reduction is more difficult to assess. The two largest exporting countries benefiting from such a reduction are Ukraine and South Africa. In the case of Ukraine, the introduction of the 15% reduction coincided with a dramatic increase in exports over the 2002-2004 period. For South Africa, on the other hand, the last two years showed

exports stable on approximately 50 000 hl, with a dramatic decrease over the 2000-2001 period. Under these conditions, it is difficult to predict the impact of removal of the 15% import duty reduction although it seems fair to say that even such a small reduction seemed to provide a competitive advantage over the countries paying full duty.

3.2. EBA

So far, exports of bioethanol from countries benefiting from the special arrangement for the least developed countries (the EBA initiative) under the GSP (EC) Regulation 980/2005 to the EU have been negligible and have primarily come from one country - the Democratic Republic of Congo - which already qualified for duty-free access as an ACP country. At the moment, the Democratic Republic of Congo is the only LDC with sizeable, though erratic, exports of alcohol to the EU under code 22 07 since 1999. In 2004 exports totalled 18 956 hl after peaking at 86 246 hl the year before.

It is fair to recognise, however, that EBA dates back to only 2001 and that some of the countries which did not have duty-free access under other earlier regimes (notably Bangladesh, Laos, Cambodia, Afghanistan and Nepal) might find new ways of access to the EU in the medium or longer term.

New opportunities might emerge in these countries - which generally do not produce (or are not very competitive at producing) sugar cane or any other raw material for bioethanol production from their own resources – in the form of processing molasses imported from their competitive, sugar-producing neighbours. This might be the case with Cambodia which could use raw material from Thailand, or with Bangladesh and Nepal which might process raw material from India. At the moment it is difficult to quantify future potential production from these countries but investments are known to have been made in some of them, like Bangladesh.

In this respect it is important to stress that under Council Regulation (EC) 2501/2001, imports are subject to the GSP rules of origin plus regional cumulation. The Commission is currently examining a proposal for a new regulation which would introduce the principle of determination of the preferential rules of origin based on the value-added method. Distillation should continue to be considered an operation with sufficient added value to confer origin on the finished product.

3.3. Cotonou Agreement

- On the whole, ACP exports to the EU under code 22 07 have so far been limited. Over the last couple of years they have, however, been fairly stable at 238 167 hl despite a low of 154 663 hl in 2004 (excluding South Africa: 48 728 hl).

- Swaziland and Zimbabwe are by far the leading exporters with an average of 85 562 hl and 120 261 hl respectively over the 2002-04 period. A number of ACP countries are likely to consider bioethanol production as an alternative to sugar production as part of the restructuring resulting from the EU sugar reform. However, bioethanol production from sugar cane might remain relatively low and limited only to countries where sugar production is competitive, such as Swaziland and Zimbabwe, which have production costs close to Brazil's and India's and which are already exporting substantial quantities to the EU under code 22 07.

LISA 11 – Achieving the 5.75% biofuels target: the balance between domestic production and imports

One of the key variables in biofuel policy is the balance between domestic production and imports. Biofuels and their raw materials are traded on world markets. An autarkic approach to meeting the EU's needs is neither possible nor desirable. But the Union still has a degree of discretion about how far to encourage domestic production and/or imports. The purpose of this annex is to set out the facts and assess the pros and cons of different options.

Tools for shifting the balance between domestic production and imports

The starting point is to understand the tools that can be used to shift the balance between domestic production and imports.

In the case of **bioethanol**, the main tool for shifting the balance is the duty paid. EU-produced bioethanol can be expected to cost about €900/toe by 2010 (costs are currently higher because most production plants are rather small). The cheapest imported bioethanol (from Brazil) can be bought in Europe at around €680/toe. Bioethanol imports are subject to duties ranging from zero (for imports from certain countries and/or under certain conditions) to about €376/toe (for undenatured ethanol imported at the maximum tariff). Consequently, imported bioethanol is cheaper than European if no import duty is paid, and more expensive if the maximum tariff is paid. If all tariffs on bioethanol were removed, it would be difficult for domestic producers to stay in the market.

In Germany, only fuel containing undenatured ethanol is eligible for fuel tax exemption. Even imported bioethanol needs the exemption in order to be price-competitive with petrol (currently around €457/toe[51]).

More details on trade arrangements affecting bioethanol are given in Annex 10.

Imports of **biodiesel** or of the vegetable oils used to make it are subject to low or zero tariffs.

Biodiesel can be made from most types of vegetable oil, notably rape oil, soya oil and palm oil.

EU rape oil competes at the world market price. Imported soya oil and palm oil are cheaper. However, biodiesel made predominantly from one or another of these oils does not comply with the "biodiesel" or "FAME" standard, EN14214 – and it needs to comply with this standard if it is to be sold for use in unadapted vehicles. Biodiesel made predominantly from rape oil does comply with the standard, even if blended with a small amount – around 25% – of one of the other oils.

The Commission believes that the limits in standard EN14214 could be adapted to allow a higher proportion of other oils – perhaps 50% – to be used in biodiesel.

Scenarios for assessment

Three theoretical models must be assessed:

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[51] Assuming oil at $60/barrel and the € at $1.25.

1) Minimum share for imports;

2) Maximum share for imports;

3) Balanced approach.

Scenario 1: Minimum share for imports

The first point to assess is the technical feasibility of this option and, in particular, whether sufficient land is available to produce the necessary crops.

The Commission estimates that in order to meet the biofuel directive's objective of a 5.75% share of the petrol and diesel market in 2010, 18.6 mtoe of biofuels will be needed. Most domestic biofuel production will come from three crops: sugarbeet and cereals (for bioethanol, replacing petrol) and rape (for biodiesel, replacing diesel). Average biofuel yields per hectare vary widely, depending on the characteristics of the crops, the soil and the climate. The following averages have been assumed:

Sugarbeet	2.9 toe/ha
Cereals	0.9 toe/ha
Rape	1.1 toe/ha

On the basis of this it can be estimated that about 17 million hectares of EU agricultural land would be needed to meet the directive's objective entirely from domestic production.

This can be compared with total EU arable land of 97 million hectares.

In the present context where crop production per hectare is rising steadily and the reform of the sugar regime will release resources currently used for food production, this appears to be technically feasible in principle. The Union is technically capable of meeting its biofuels targets for 2010 from domestic production, although it should be noted that there are agronomic limits on the cultivation of individual crops (e.g. the frequency with which rape can be included in crop rotation cycles)..

However, it should be pointed out that: existing trade arrangements and World Trade Organisation commitments do not permit the EU to close the door to imports of biofuels and biofuel raw materials; these materials are already being imported today; and there is no proposal to increase tariff protection for these goods. Therefore, the scenario of 100% domestic production is a theoretical one and would not be possible in practice.

Even interpreted as "minimum imports" rather than "no imports", this scenario would have two disadvantages.

First, it would expose the EU food and biofuels sectors to excessive increases in the price of raw materials. By creating a new market that could be served only by domestically produced crops, the biofuels policy would drive up their prices, particularly for cereals and rape which are currently traded at world market prices.

Second, it would do nothing to encourage the production of biofuels elsewhere in the world where the creation of new biofuels industries – partly serving foreign customers like the EU, partly domestic needs – can bring benefits to developing countries. In addition, to the extent

that increased consumption of biofuels is a tool to exercise downward pressure on the oil price, this is a global phenomenon – and the EU therefore has an interest in promoting biofuel production globally.

Scenario 2: Maximum share for imports

By encouraging amendment of the biodiesel standard, the EU would ensure that the maximum proportion of its biodiesel consumption is met from imports. The Commission believes that, with an appropriate amendment, imported vegetable oils would capture about 50% of the biodiesel market. However, much of the processing is likely to continue to take place in the Union.

By removing all tariffs on bioethanol, the EU would ensure that the maximum share of its bioethanol consumption is met from imports. The Commission believes that bioethanol made from agricultural crops in Europe will not be able to compete on price with bioethanol made from sugar cane from tropical countries. Therefore, the result of this policy would be that 100% of EU bioethanol consumption would be covered by imports. There would be no domestic bioethanol industry.

On the hypothesis that 56% of biofuel consumption will be biodiesel (in line with diesel's current share of the petrol and diesel market), these steps would lead to imported biofuels (or their raw materials) taking about 70% of the EU biofuel market.

For biodiesel, this approach has merit. It would enable both EU producers and developing countries to benefit, in a balanced way, from the growth of biofuel consumption in the EU. It is an appropriate response to the limits on expansion of rape production in the EU. An EU industry would continue to exist.

But this strategy would not address the serious concerns that the present expansion of vegetable oil production – such as palm oil and soya – in developing countries could be responsible for destruction of natural habitats and deforestation and that increased demand from the EU could translate into an increased rate of deforestation. If this is true, it would be an important factor to set against the greenhouse gas emission reductions that the increased use of biofuels would deliver. If such doubts cannot be removed, public support for biofuels will be undermined. Therefore, it would be wrong to maximise the import of biofuels/raw materials for biofuels without paying attention to the environmental impact of their cultivation.

For bioethanol, this is not a good approach for the EU to follow. If the EU obtains its bioethanol from imports rather than domestic production, the cost will be about 25% lower and the global greenhouse gas benefits will be greater. However, there will be no rural development benefits for Europe. And the security of supply benefits will be less, because Europe will not have the advantage of developing a new domestic fuel source. From a practical point of view, it must be remembered that implementation of the Union's biofuel policy depends on the efforts of Member States. If there is no prospect of domestic involvement in the production of bioethanol, it is likely that many of them will focus their efforts on biodiesel instead – eroding the market into which developing countries hope to sell. Finally, if the least developed countries are not able to compete on price on the world sugar market, there is no reason to believe that they will be able to do so on the world bioethanol market if trade is made completely free.

Environmental concerns are also raised about the cultivation of sugar cane for bioethanol. Against this, it is argued that most bioethanol comes and will continue to come from land that has been under cultivation for a long time.

Scenario 3 –Balanced approach

The Commission believes that an intermediate approach would avoid the disadvantages of the first two options.

This approach should have five elements:

i) Amendment of standard EN14214 to facilitate the use of a wider range of vegetable oils for biodiesel, to the extent feasible without significant ill effects on fuel performance;

ii) Maintain market access conditions for imported bioethanol that are no less favourable than those provided by trade agreements currently in force;[52]

iii) Pursue a balanced approach in ongoing free trade agreement negotiations with ethanol-producing countries/regions. The EU must respect the interests of domestic producers and EU trading partners, within the context of rising demand for biofuels; [53]

iv) Address the issue of amending the biofuels directive so that only biofuels whose cultivation complies with minimum sustainability standards count towards its targets;

v) Support developing countries in the production of biofuels.

The system of certificates would need to apply in a non-discriminatory way to domestically produced biofuels and imports. In particular, it would need to be non-discriminatory in relation to the requirements of the World Trade Organisation. It would need to be developed in line with other initiatives for certification of agricultural and forestry produce and could require EU support in its introduction. The potential impact on developing countries would be taken into consideration before any system of certification is introduced.

The Commission estimates that under this approach:

- price increases for agricultural crops could be kept in an acceptable range;

- a sufficient share of the market for biodiesel raw materials, a majority of the market for biodiesel production, and a majority of the market for bioethanol would remain domestic;

- least-developed countries, including those for whom the reform of the EU sugar regime is a particular challenge and whose bioethanol is not subject to tariffs, would gain a share of the EU biofuel market;

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52 In particular, under the Everything But Arms, Generalised System of Preferences (+) and Cotonou agreements, which presently provide free access to the EU for ethanol imports.

53 Note: existing trade agreements, notably Everything But Arms (EBA), Generalised System of Preferences (GSP) + and Cotonou, which presently provide free access to the EU for ethanol exports, will maintain this level of access..

- the promotion of biofuels would not cause deforestation and habitat destruction.

Notes on the production of biofuels in developing countries

Support for developing countries in the production of biofuels is in the EU's interest both for development policy reasons and to maximise downward pressure on the oil price. It could contribute in specific countries, as in the EU but often in more critical situations, to greater energy security and access to energy, improved foreign exchange and trade balances, economic development and employment in rural regions, and environmental benefits. To the extent that the development of biofuel consumption will exert downward pressure on the global oil price, consumption in developing countries will contribute in the same way that European consumption does. EU development policy, as well as other EU policies such as research and energy and the clean development mechanism under the Kyoto Protocol, offers a number of instruments that can be used.

The positive and negative impacts of cash crops for biofuels on food production and food security have been the subject of extensive discussion. The costs and benefits depend on the site, the way the crop is produced and how it is integrated in the local production system. There is no general rule. Sugar cane has almost always been cultivated as a cash crop in developing countries, and a switch in the end-product from sugar to ethanol should not affect the food supply of the region. Some biofuel raw materials like jatropha could allow the sustainable use of low-value land and, in the process, contribute (via earnings) to an improvement in food security.

LISA 12 – The Commission's perspective on biomass and biofuel research

1. Introduction

Research, technological development and demonstration have potential to support the use of biomass. The Commission intends to capitalise on this. Its proposal for the Seventh Framework Programme – Specific Programmes, adopted in September 2005, gives a high priority to biomass.

An industry-led European biofuel technology platform is under development[54]. This is intended to develop and implement a European vision and strategy for the production of biofuels, in particular for transport. Once the technology platform is established, the EC will explore the need to propose a possible joint technology initiative in this area[55].

Other technology platforms will also play an important role – for example, those dealing with "Industrial biotechnology", "Plants for the future", "Road transport" and "Forest-basedsectors". Under the framework of the Seventh Framework Programme, there is a need for increased coverage of the following topics: biomass availability and logistics ; energy crops for the production of biomass;[56] and combustion, gasification and pyrolysis of biomass covering co-firing, recovered fuels and combined heat and power.

This research and development activity under the Seventh RTD Framework Programme will be complemented by non-research action in the "Intelligent Energy – Europe" programme. The main focus here is to support soft measures and to remove non-technological barriers to the widespread market deployment of already demonstrated biomass and biofuel technologies.

2. Research priorities – biomass in general

The following actions related to biomass, with their corresponding objectives, are included in the Seventh Framework Programme.

- *Biomass for electricity, heating and cooling*

The objective is to develop and demonstrate a portfolio of technologies for electricity, heating and cooling from biomass, including the biodegradable fraction of waste. This research aims at increasing overall conversion efficiency, achieving cost reductions, further reducing the environmental impact and optimising the technologies in different regional conditions. A broad range of research topics are considered including biomass availability and logistics; conversion technologies, such as combustion, co-firing and gasification; emission abatement; and land use.

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54 Technology platforms are channels to involve industries in defining research priorities.

55 Joint technology initiatives are a new way to create public-private partnerships at European level. They have their foundation in technology platforms. They may take the form of a joint undertaking.

56 With emphasis on woody crops (short-rotation coppice, grasses and miscanthus); on new crop breeds and novel cropping systems optimised for non-food use; on improving the energy content of the agricultural crops used for first-generation biofuels; and on machines and techniques for planting, harvesting, storage, transport, pre-treatment and conversion into material that can be fed into conveyor systems.

The Commission will propose to the "Zero Emission Power Generation" technology platform that co-firing be included in its scope.

- *Smart energy networks*

To facilitate the transition to a more sustainable energy system, a wide-ranging R&D effort is required on the EU electricity and gas systems and networks. Research aims at effective integration of biomass installations into electricity grids and feeding biogas and synthetic natural gas into the natural gas grid.

- *Life sciences and biotechnology for sustainable non-food products and processes*

The objective is to strengthen the knowledge base and develop advanced technologies for terrestrial or marine biomass production for energy and industry. Biotechnology will be applied to improve the productivity, sustainability and composition of biomass raw materials and to develop new bio-processes.

The Commission also attaches high importance to the "biorefinery" concept to maximise the value derived from biomass feedstocks by making full use of their components. Biorefineries could be built up by adding further fractionation and conversion steps to current biomass processing facilities (sugar, grain, pulp mills, oil refineries, etc.) to obtain a broad range of products such as food, feed, sustainable polymers, chemicals, fuels, and heat and power. Improving the cost-efficiency of biofuels through the biorefinery concept will be an important element of the biofuel technology platform.

3. Second-generation biofuels: state of play

Producing bioethanol from cellulose delivers a gasoline substitute which is identical to bioethanol produced from sugar or cereals. Synthetic enzymes provide the key to unlock the cellulose molecules and break them down into simpler substances, which are subsequently fermented to ethanol and purified (distilled) the same way as conventional bioethanol. It is hoped that energy balances and, hence, CO_2 emission reductions will be largely enhanced.

The first demonstration plant was taken in operation by Iogen (4 million litres per year in Canada) and this was followed by ETEK (150 thousand litres per year pilot plant in Sweden) which was supported by EU regional funds. A third facility is under construction by Abengoa (5 million litres per year in Spain) and this plant is supported by the Fifth Framework Programme. Enzymatic hydrolysis is expected to become competitive in the medium term due to the decreasing price of the enzymes and low cost of the raw material (such as straw or even wood); being one of the most critical parameters in the overall cost of the biofuel.

Second-generation biodiesel is chemically different from vegetable-oil-based biodiesel. Gasification of biomass (anything works, but the drier the better) produces a "synthesis gas" consisting mainly of carbon monoxide (CO) and hydrogen. Exposing this gas to a suitable catalyst converts it into hydrocarbons (Fischer Tropsch synthesis), which will subsequently be treated to deliver a mixture of gasoline, jet fuel and diesel. Because of the high price of jet fuel, the excellent quality of the diesel fraction and the low quality of the gasoline fraction (low octane number), the process is normally optimised towards the production of jet fuel/diesel.

The different steps in the process have all been demonstrated to work commercially for Fischer Tropsch synthesis gas derived from coal or natural gas. Optimisation still remains to be done on gasification of biomass from different raw materials and gas purification to synthesis gas quality. A large-scale pilot plant (15 000 t/year) is being constructed in Freiberg (Germany) by the company Choren. In addition, Choren and Shell are in the process of developing a full-size prototype commercial plant with a capacity of 200 000 t/year which optimistically, depending on the experience with the pilot plant, could be operational in 2009/10. In parallel to the experience to be gained from this "biomass-to-liquid" (BTL) process, a number of large-scale "gas-to-liquid" projects, several in Qatar, will deliver technology experience on the second stage (Fischer Tropsch) of the process in the years ahead.

Alternatively the synthesis gas can be converted to bio-dimethylether (DME), which can also be used to replace diesel in modified diesel engines. DME, a gaseous fuel under ambient conditions, can be of particular relevance in heavy-duty applications.

The advantage of second-generation biodiesel is partly that the basic treatment of the raw material (gasification) allows virtually any organic material to be used and partly that it delivers a premium-quality diesel fuel, whether to be used in its own right or as a blending component in petroleum-based diesel. Its CO_2 emission profile depends on whether the energy source for conversion is biomass only or whether an external energy source is used, and whether the biomass is a waste product (e.g. straw) or an energy crop. This also affects the cost. Here too, significant CO_2 gains and energy balance improvements are hoped for.

Hybrids between first- and second-generation biofuels are also in preparation. Fortum (Finland) is planning to expand its Porvoo refinery to use vegetable oil and animal fat as a raw material in a conventional hydrogenation process. This delivers the same high-quality diesel as BTL with lower investment, but higher raw material costs (close to conventional biodiesel).

4. Research priorities - transport biofuels

The main area of research is second-generation biofuels made from various biomass resources and wastes, e.g. bioethanol, biodiesel, DME. The technical feasibility of converting cellulose material (straw/wood) and organic wastes into bioethanol and biodiesel has been demonstrated. But costs need to be brought down and technology needs to be further developed and demonstrated for commercial-scale production (over 150 000 tonnes a year). If this can be done, second-generation biofuels should offer three major advantages:

- they will secure a higher market share for biofuels by allowing the use of a wider range of raw material;
- the cultivation process (if any) could be less environmentally intensive than for ordinary agricultural crops;
- this lower intensity will be reflected in lower greenhouse gas emissions from cultivation.

Second-generation biodiesel production has a fourth advantage: the fuel is of better quality than conventional diesel[57].

[57] The process can also be used to produce a (good) substitute for jet fuel or a (poor) substitute for petrol.

The price of these fuels will depend on technical developments and the price at which the raw material can be obtained. At this stage there is no reason to assume that they will be substantially cheaper than first-generation biofuels.

The Commission plans to substantially increase its support for the development of second-generation biofuels through its research budgets.

LISA 13 – Results of consultation

This communication and the impact assessment published alongside it take into account the results of extensive consultations. These began with the Commission's analysis of the various policies affecting biomass and an extensive public consultation campaign using all possible means, such as a public questionnaire via the Internet, numerous meetings with stakeholders, and bilateral meetings with Member States that have developed national Biomass Action Plans and with biomass experts.

The main conclusion drawn from the consultations was that the Commission should push strongly on all fronts, at EU level and national level, in order to overcome the non-technical barriers facing biomass.

Several more specific conclusions can be drawn from the consultation process:

- Sufficient biomass resources are available in the Union to meet the needs for an additional 80 mtoe per year by 2010 without major effects on forest products industries and food production. Energy crops can make a significant contribution while providing a new market outlet for agriculture and contributing to rural development. Any shortfalls can be addressed by imports.

- There are competitive, reliable and efficient European technologies to convert biomass resources into energy vectors (electricity, heating or cooling and biofuels for transport). Nevertheless, RTD work on biomass (supported by appropriate national and EC funds) has to be intensified in order to meet new challenges.

- European (as well as international) solid and liquid biofuels markets are in their infancy and have to be developed further to commodity level. In order to develop them successfully, work on standards and norms has to be accelerated.

- Biomass is generally more expensive than comparable fossil fuel energy. However, in some areas (such as household heating by pellets and industrial CHP based on residues) biomass is already competitive.

- There is an urgent need to start a professionally managed campaign to inform European citizens more fully about the benefits of biomass. This information barrier, as well as the absence of more effective representation of biomass at all levels, is also due to the lack of a strong European biomass association with industrial involvement.

- The main problem that appears to be holding back the penetration of biomass on the energy markets is the lack of demand. The only way to increase demand is through appropriate policies implemented at national level.

- Biomass is the only renewable energy source that does not suffer from intermittency problems and can potentially provide energy for heat, power and transport from the same installation.

- Biomass in the form of solid, liquid or gaseous biofuels is the only renewable energy source that can directly replace solid, liquid and gaseous fossil fuels, either fully or in blends of various percentages, in which case often there is no need for equipment modifications.

- Biomass is the only renewable energy source that cannot be found free; it necessitates a long chain of activities such as planting, growing, harvesting, pre-treatment (storage and drying) and upgrading to a fuel and, finally, mechanical, thermochemical or biological conversion into an energy carrier (power, heat or biofuels for transport). Therefore, biofuels (with the exception of untreated municipal waste) always have an associated cost that has to be borne by the final user.

- Since land availability is limited there could come a point in the future when biomass for energy will have to compete with food, materials, bio-chemicals and carbon sinks. However, this point in time is beyond 2020, and if international trade in biomass fuels becomes effective could lie beyond 2050.

- Environmental concerns must also be addressed whenever biomass is grown for food, products or fuels. This has to be done by taking an overall systems approach and by comparisons with other alternatives and not in isolation.