

### National GHG calculators in Germany and EU – harmonized in co-operation with BioGrace

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- IFEU
- Public workshop Heidelberg
- April 14, 2011





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- 1. Introduction
- 2. German GHG calculator
- 3. Spanish GHG calculator
- 4. UK GHG calculator
- 5. Dutch GHG calculator
- 6. Comparison of results
- 7. Conclusions

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### Introduction

#### 1) BioGrace Tool

- Reproduces 22 pathways from EU RED Annex V
- Allows use of individual input numbers

#### 2) Making actual calculations not straightforward

- Some kind of tool or software is needed
  - o Some companies will develop own tools
  - o Many others will use publicly available tools (e.g. national tools)

#### 3) National Tools

- Are being developed in Germany, Spain, Netherlands, UK
- Have different target groups and purposes.

# → Project BioGrace will ensure that all calculators will give the same result

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- 2. German GHG calculator
- 3. Spanish GHG calculator
- 4. UK GHG calculator
- 5. Dutch GHG calculator
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### German tool - general information

#### Background

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- o 7 german tools, 1 tool (palm oil) published online september 27th 2010
- o made by IFEU, contracted by BMU
- o Stakeholder workshop on october 7th 2010 (auditors, WWF, scientific palm oil experts, BLE national regulator)
- o Next workshop on may 5th 2011 (BLE)

#### The German GHG calculator

- o Focus of national calculator: user friendliness tailored to a narrow target group (non-expert user: farmers, oil millers, refinery operators, last interface)
- o Main differences:
  - strongly linked to economic operators: 1 sheet dedicated for cultivators, mill operators, refinery operators, etc.
  - Reference units for GHG emissions different in each sheet (kg FFB, kg CPO, kg refined oil)





H + > H Start / About / Actor cultivation / Land use change / Carbon Stocks / Actor oil mill / Supplier list oil mill / Actor refinery / Supplier list refinery

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### **German GHG tool**

- One sheet for each economic operator
- Box A: Results
- Box B: step-by-step manual
- Box C: Calculation of emissions

### Biofuel Greenhouse Gas Emissions in Europe German GHG tool – Cultivation



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K · · N Start / About Actor cultivation / Land use change / Carbon Stocks / Actor oil mill / Supplier lis



**German GHG tool** 



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### Biofuel Greenhouse Gas Emissions in Europe German GHG tool – Oil miller









### **German tool - Summary**

#### Contents

- o Excel-based tool
- o The software programming makes it inflexible
  - Not possible to modify pathways or build new ones

#### Status

- o Palm oil tool available via www.ifeu.de
- o Tools ready but not available online:
  - Cereals-to-ethanol (wheat, barley, rye, triticale, corn)
  - Plant oil (rapeseed, sunflower, soy)
  - Biodiesel
  - Biogas
- o Tools in pipeline
  - Sugarbeet-to-ethanol
  - Sugarcane-to-ethanol
- o Should be finalised mid 2011

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Slide 13



0

- 1. Introduction
- 2. German GHG calculator
- 3. Spanish GHG calculator
- 4. UK GHG calculator
- 5. Dutch GHG calculator
- 6. Comparison of results
- 7. Conclusions

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# Spanish tool - general information

### Background

- o No public tool has been available so far in Spain
- Aim: to provide stakeholders (especially farmers and small biofuel companies) with a tool to calculate the GHG emissions required by the RED

### The Spanish GHG calculator

- o being developed by CIEMAT, contracted by IDAE
- o focuses on agricultural stages
- o Focus on Spain:
  - Contains data on agricultural inputs and yields for 6 crops used to produce biofuels in Spain at the level of agrarian county (NUTs4)
  - Any farmer in the country can select his/her county and crop and the corresponding values regarding agricultural inputs and yields will appear in the tool.
- uses data from NUTS study (actual values or averages calculated for smaller geographical areas)

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### **Spanish tool – specificities**

#### Contents

- o Tool build in Java
- o For processing and transport: RED default values
- o Standard values from BioGrace

#### **Status**

- o Biodiesel from rapeseed, rapeseed HVO and ethanol from wheat CHP chains ready
- o Final version expected mid-2011





SPANISH BIOFUELS CALCULATOR







#### Agricultural county selection screen

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Slide 18

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- 1. Introduction
- 2. German GHG calculator
- 3. Spanish GHG calculator
- 4. UK GHG calculator
- 5. Dutch GHG calculator
- 6. Comparison of results
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### **UK tool - general information**

### Background

- UK GHG calculator was developed under RTFO reporting scheme
- o Calculator existing since 2008, regularly updated
- o Aim is to facilitate stakeholders calculating actual values under RTFO reporting

#### The UK GHG calculator

- o was made and is regularly updated by consultant E4Tech, contracted by RFA
- o has recently been made "RED-proof"
- o strongly linked to RTFO reporting scheme
- o provides more "standard values" as compared to BioGrace

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Slide 20



## **UK tool - Summary**

#### Contents

- o Tool build in LCA-software package
- o Tool can produce supplier monthly and annual C&S reports
- o Tool differs from BioGrace Excel sheets:
  - More than 250 biofuel production pathways included
  - DLUC calculations not included
- o The software programming makes it flexible
  - Rather easy to modify pathways or build new ones

#### **Status**

Slide 21

- o Tool on-line via <u>www.renewablefuelsagency.gov.uk</u> including a user manual
- All chains available (and more) but not all chains give same result (yet) as compared to RED defaults

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BIOGRALE Harmonised Calculations of Biofuel Greenhouse Gas Emissions in Europe

### **UK GHG tool**







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- 1. Introduction
- 2. German GHG calculator
- 3. Spanish GHG calculator
- 4. UK GHG calculator
- 5. Dutch GHG calculator
- 6. Comparison of results
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### **Dutch tool - General information**

#### Background

- o Dutch government prepared a reporting obligation on sustainability for biofuels to start per 1-1-2009
- o This was abandoned after the publication of the draft Renewable Energy Directive (RED).

#### The Dutch GHG calculator

- o was developed in 2007/2008 by consultants EcoFys and CE
- o has been available for (Dutch) stakeholders to make GHG calculation on biofuels
- has not been used extensively due to lack of legal framework in 2008 2010

o was recently updated and made "RED"- proof by Agency NL

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Slide 24



### **Dutch tool - Summary**

#### Contents

- o Excel-based tool
- o Tool is rather similar to BioGrace Excel sheets, but
  - It is more user-friendly:
    - no calculations details, results in graphs
  - DLUC calculations are user-friendly
- o The software programming makes it less flexible
  - More difficult to modify pathways or build new ones

### **Status**

Slide 25

- o Tool is available on-line via
  - www.senternovem.nl/gave\_english/ghg\_tool
- o All 22 chains (BioGrace) are included
- o Updates follow updates of BioGrace Excel sheet

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0

- 1. Introduction
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- 3. Spanish GHG calculator
- 4. UK GHG calculator
- 5. Dutch GHG calculator
- 6. Comparison of results
- 7. Conclusions

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### **Comparison of results**

Check list Version 3.0 February 2011	Default greenhouse gas emissions								
	Table A RED Annex V/FQD Annex IV	BIOGRACE W3		BIOGRACE WP4 National GHG Calculators					
Biofuel production pathways	Default value	1/25/298	1/23/296	The Netherlands ANL	Germany IFEU	Spain CIEMAT	ик		
Ethanol wheat lignite	70	69.9	69.8	69.9	67.9		7		
Ethanol wheat (proces fuel not specified)	70	69.9	69.8	69.8	67.9		7		
Ethanol wheat (natural gas - steam boiler)	55	54.9	54.6	54.6	52.8	55.61	5		
Ethanol wheat (natural gas - CHP)	44	44.3	44.1	44.1	42.2		4		
Ethanol wheat (straw)	26	26.1	26.0	26.0	24.0		2		
Ethanol corn	43	43.6	43.4	43.4	42.6		4		
Ethanol sugarbeet	40	40.3	40.1	40.1			4		
Ethanol from sugarcane	24	24.3	24.0	24.0			2		
Biodiesel rape seed	52	52.0	51.7	51.8		52.51	5		
Biodiesel palm oil	68	68.7	66.0	66.0	68.9		6		
Biodiesel palm oil (methane capture)	37	37.1	36.9	37.0	36.3		3		
Biodiesel soy	58	57.2	56.9	57.0			5		
Biodiesel sunflower	41	40.8	40.6	40.6			4		
Biodiesel UCO	14	21.4	21.3	21.3			1		
PVO rape seed	36	36.1	35.9	31.2			з		
HVO rape seed	44	44.5	44.2	44.2		44.57	4		
HVO palm oil	62	61.6	58.9	58.9			6		
HVO palm oil (methane capture)	29	29.1	29.0	29.0			2		
HVO sunflower	32	32.9	32.7	32.7			3		
Biogas - dry manure	15	14.3	13.0	12.9			1		
Biogas-wet manure	16	15.8	14.5	14.4			1		
Biogas - MSW.	23	22.7	21.4	21.4			2		
	1/25/298	1/25/298	1/23/296	1/23/296	1/25/298	1/23/296			

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Slide 27 April 14, 2011





0

- 1. Introduction
- 2. Dutch GHG calculator
- 3. German GHG calculator
- 4. Spanish GHG calculator
- 5. UK GHG calculator
- 6. Comparison of results
- 7. Conclusions

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### Conclusions

#### Several GHG calculators available

- o Two (UK, Dutch) exist since 2008, three (Germany, Spain, BioGrace Excel sheets) are newly developed
- o Some allow to modify or build new pathways, others don't

#### National GHG calculators have different aims

- o Some are more focussed on national data or national reporting, others are more international oriented
- o Focus on different aspects
  - Agricultural stages (Spain)
  - Supply of data through the chain of custody (Germany)

#### →Project BioGrace will ensure that all calculators will give the same result

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Slide 29



### Thank you for your attention

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Slide 30

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	А	В	С	D	E	F	G	Н		J	K
70		Which shrinkage factor is a	applied?		_						
71			1,0	%							
72		Emissions transport (inkl.	10,25	g CO2eq per kg ethanol							
73		Emissions cultivation (inc	684,89	g CO2eq per kg wheat							
74											
75		What is the size of your oi	l batch (consignn	nent)?							
76			30.000	kg							
77											
78		STEP 5 - Other greenhouse	gas sources or s	avings							
79		Are there any other sourc	es of greenhouse	gas emissions during your pro	duction process?	. Please describe:					_
30		How much CO2eq arise fro	m these sources	Note that you may be requir	ed to provide det	ailed evidence of this	Help for oil n	nill operator		×	┛
31		number in the auditing pro	ocess	i note that you may be requir	cu to provide det		The S	TEP 5 box allow		include •	а.
32			0	g CO2eq per kg oil.			"outs	ide-the-box" are	enhouse	aas	
		Do you apply any measure	es that reduce CC	02 emissions in your productio	n process? e.g. er	mission savings from	emiss	sions, i.e. to inc	lude area	enhouse	
55		replacing transport diese	with biodiesel. P	lease describe			gas s	ources or saving	as from i	oractices	
34		llew much cookers	example text				that a	are not covered	by the		
35		evidence of this number in	the auditing pro	ures per kg oll? Note that you locess	may be required t	to provide detailed	calcu	lation tool.	,		
36			0	g CO2eq per kg oil.							
37							First	you need to cal	culate th	e CO2	18
28		STEP 6 - Combination of va	lues				emiss	sions or savings	of your		18
39		Pre-products	1.694	g CO₂eg per kg oil			produ	iction practice of	on your o	own	
90		Transport	10	g CO2eq per kg oil			accor	ding to good LO	CA practi	ce. Then	
21		Oil mill	224	a COpea ner ka oil			VOUA	ntor the recult i	in the ar	non 🔳	
e e e	+ +	Land use change / Carbor	Stocks Actor oi	I mill / Supplier list oil mill / Actor	refinery / Supplier	list refinery		close window			
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