Financial support for electricity generation & CHP from solid Biomass

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Trinomics

Contract details

Natural Resources Defense Council

Financial support for electricity generation and CHP from solid biomass

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CONTENTS

1 Bioenergy subsidies

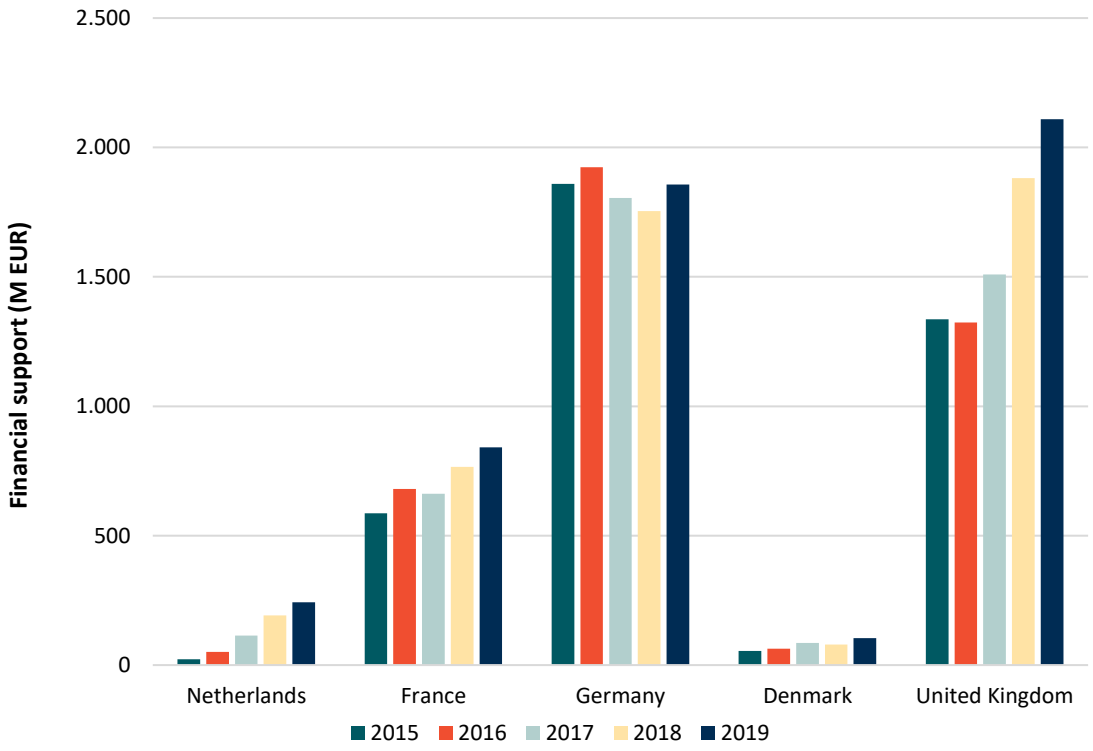
1.1 Overview of the share of biomass in total renewable energy subsidies – 2015-2019

The development of bioenergy subsidies for the five in-scope countries during the period 2015-2019 is depicted in Table 1. The Netherlands shows the largest increase since 2015, with subsidies increasing around 10 times in this period as energy companies took advantage of the SDE+ subsidy. Denmark, France and the UK also saw large relative increases of between 40-90% over the period. The UK has overtaken Germany in 2019 to have the highest subsidies. In Germany subsidies to solid biomass have remained relatively stable over time as growth in bioenergy use for electricity has also plateaued. In the UK use of biomass for electricity has accelerated as subsidies have also increased, such as through the contracts for difference.

Table 1-1 Summary of bioenergy subsidies 2015-2019, EUR million

Country	Bioenergy subsidies (EUR million)					
	2015	2016	2017	2018	2019	% Change 2015-2019
Netherlands	23	51	114	192	242	967%
France	587	680	662	765	841	43%
Germany	1 859	1 924	1 805	1 754	1 856	0%
Denmark	55	64	85	79	104	89%
United Kingdom	1 336	1 323	1 509	1 882	2 109	58%
Sub-total	***3 859***	***4 042***	***4 175***	***4 672***	***5 152***	***21%***

Figure 1-1 Financial support in bioenergy per country for the period 2015-2019, EUR million



2 Reconciling the 2020 figures with the 2019 figures

The values reported in 2019 were updated by using new data and more detailed further research carried out since 2019. Therefore, several changes in the historic values (2015-2018) can be observed. More specifically:

Netherlands

Only minor variations were observed since 2019, with these focused on the Energy Investment Rebate (EIA) subsidy. This was updated as additional data became available regarding the grants for solid biomass technologies supported through tax incentives under the EIA. The specific expenditures related to biomass technologies became available, whereas in the previous study all the expenditures classified as "Others" were assumed to be biomass related.

France

The following updates were made, with the addition of subsidy 3 and changes to subsidy 1 and 4 being particularly influential in changes relative to 2019.

- Subsidy 1- "Heat Fund": The values for the total grants in all eligible heat vectors/technologies have been updated since the 2019 study as improved official statistics for this measure were identified, this lead to a significant increase in the subsidies;
- Subsidy 2-" Compensation supplement": this is a new subsidy, it was not included in 2019;
- Subsidy 3- "Reduced (10%) VAT rate applicable to deliveries of firewood and related wood products": this subsidy was not included in the previous study;
- Subsidy 4- "CPSE – Feed-in tariffs - other RES (non solar, non wind)": An updated official source was used, with final values for earlier years, leading to an increase in the subsidy amounts.

Germany

The following updates were made, the addition of subsidy 4 being the most significant change relative to 2019.

- Subsidy 1-" EEG feed-in tariff and premium for biomass": updated data for all the in-scope years, subsidy value estimated on basis of share of solid biomass in total bioenergy from electricity – but due to different rates by technology and installation size and a lack of specific data, the estimate that was made may be an under or over estimate of the actual total;
- Subsidy 2- "CHP feed-in tariff from biomass and waste (KWK Umlage)": improved source data allowed for refinement of historic values;
- Subsidy 3-" Reduced VAT tariff for pellets and firewood": only minor variation in data as updated source used;
- Subsidy 4-" Promotion of single measures for the use of renewable energy": this subsidy was not included in the previous study.

Denmark

The values for Denmark show minor variations based on updates to official source data and exchange rates used.

United Kingdom

The following updates were made, the changes to subsidy 1 and the addition of subsidy 4 being particularly influential in changes relative to 2019.

- Subsidy 1- "Domestic Renewable Heat Incentive (RHI) payments – biomass": only very minor changes due to updated exchange rates;
- Subsidy 2-" ROCs – Fuelled": only minor variations in data for 2015-2017, based on updated official statistics. 2018 and 2019 data added;
- Subsidy 3-" Non-domestic renewable heat incentive": only very minor changes due to updated exchange rates;
- Subsidy 4-"Contracts for difference": updated values based on improved official source, values for 2017 almost the same, only exchange rate difference. Small addition of subsidies paid in 2016. For 2018 data in the 2019 study was sourced for single installation, whereas a new installation became active in 2018, this is added in the new values;
- Subsidy 5-" Climate change levy (CCL) Exemption of electricity generated from certain renewable resources": this subsidy was not included in the previous study. It is important only historically as the subsidy relevant for biomass has effectively ended in 2018.

The 2019 report also included a subsidy of around €160-180 million value called the winter fuel payment. This was excluded in this report as the scope for this work is to exclude general subsidies to energy consumption such as this.

2.1 Overview of the share of biomass in total renewable energy subsidies – 2015-2018

The share of bioenergy subsidies against the share of subsidies for all RES is presented in Table 2 for the period 2015-2018. 2019 is excluded from the analysis since there are no available data for the total RES subsidies of that year.

In Denmark bioenergy represents a relatively small, although increasing, share of the total financial support given to renewables. In the Netherlands the share rose from 2% in 2015 to 12% in 2018, in France and the UK the share of bioenergy subsidies also increased, although more slowly than in the Netherlands. The United Kingdom has the highest share of biomass subsidies among the five countries. The share of biomass in total RES subsidies has decreased in the last years for Germany.

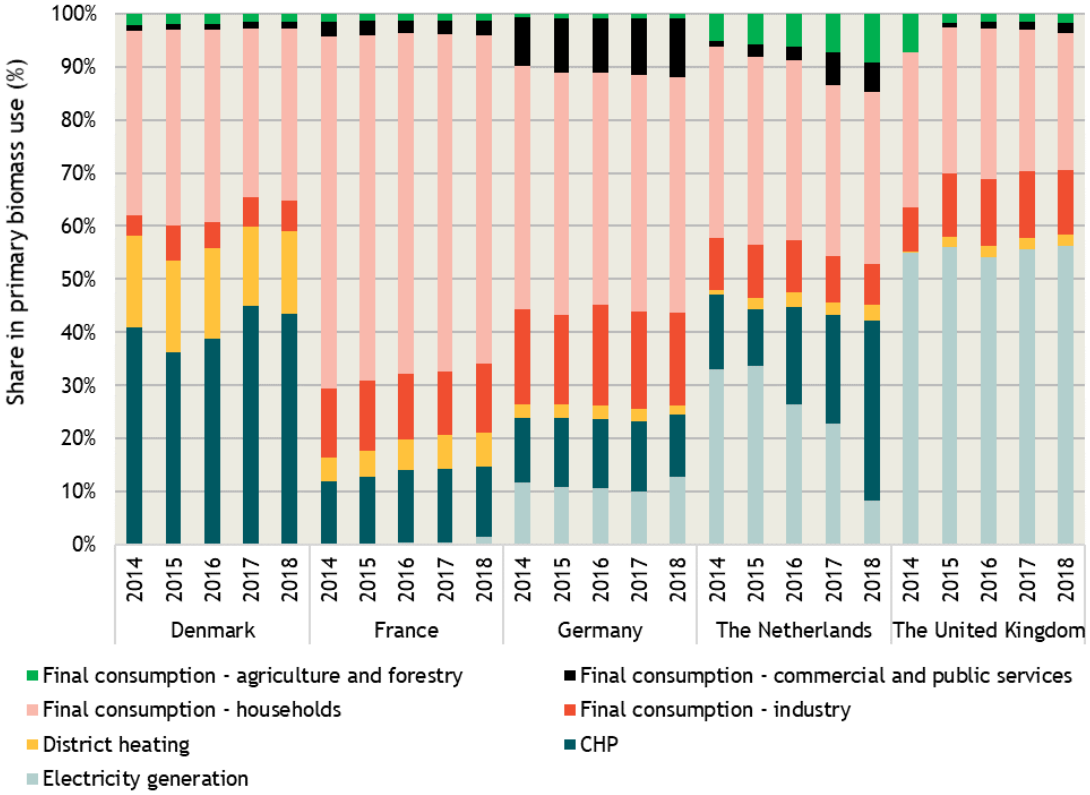
Table 2-1 Overview of the share of biomass in total renewable energy subsidies 2015-2018

Country	Bioenergy subsidies (EUR million)				RES subsidies (EUR million)				Bioenergy as % of total			
	2015	2016	2017	2018	2015	2016	2017	2018	2015	2016	2017	2018
Netherlands	23	51	114	192	1 039	1 255	1 448	1 627	2%	4%	8%	12%
France	587	680	662	765	5 112	5 205	5 335	5 476	11%	13%	12%	14%
Germany	1 859	1 924	1 805	1 754	26 652	26 909	27 952	29 106	7%	7%	6%	6%
Denmark	55	64	85	79	1 247	1 266	1 316	1 150	4%	5%	6%	7%
United Kingdom	1 336	1 323	1 509	1 882	8 259	8 442	8 948	9 322	16%	16%	17%	20%
Total	**3 859**	**4 042**	**4 175**	**4 672**	**42 307**	**43 077**	**44 999**	**46 681**	**9%**	**9%**	**9%**	**10%**

2.2 Overview of the uses of solid biomass for energy purposes

The energy uses of solid biomass vary among the five investigated countries, as depicted in Figure 4-2. In all countries consumption by households plays an important role, and this is particularly important in France and Germany, both of which provide subsidies to fuelwood. The United Kingdom used solid biomass for electricity generation purposes far more than the other countries, reaching more than 50% for the whole period 2014-2018. In Denmark, solid biomass was used mainly for CHP, district heating and by households. While in France and Germany, final consumption from industry accounted for approximately 15%. In the Netherlands, the use of biomass for CHP presented an increasing trend, as does consumption by the agriculture and forestry sector, while the opposite is true for electricity generation uses. The increase in the agriculture sector consumption driven by the large horticulture (greenhouse) sector in the Netherlands. Germany has the most significant consumption by commercial and public sector users.

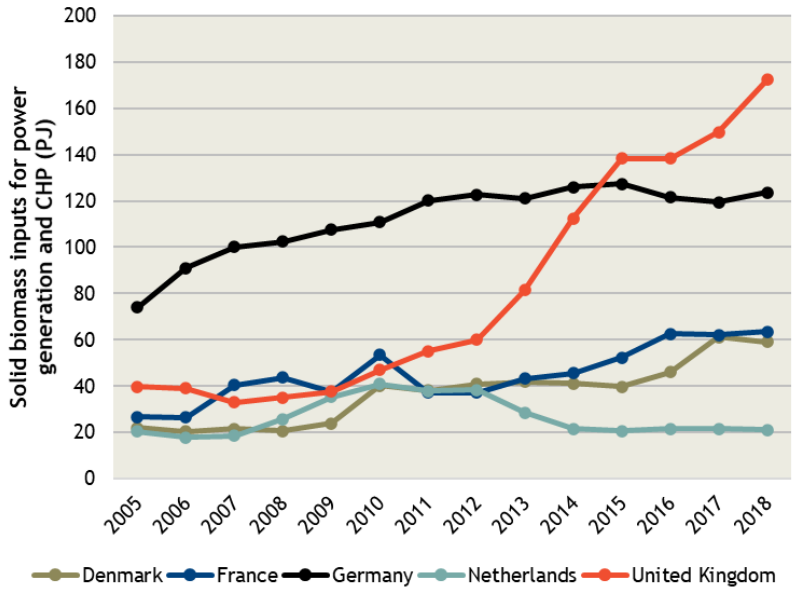
Figure 2-1 Overview of the uses of solid biomass by consumption type in 2014-2018



2.2.1 *Solid biomass use in electricity generation, district heating, and combined heat and power plants*

By looking at the use of solid biomass for electricity generation and CHP for the period 2005-2018 (Figure 4-3), we can see that Denmark, France and the Netherlands followed overall a similar pattern, while in the latest years they stabilised their consumption. On the other hand, the United Kingdom showed a significant increase of solid biomass inputs in electricity and CHP especially after 2012, while Germany had the highest consumption among the 5 countries until 2014, when the United Kingdom surpassed it.

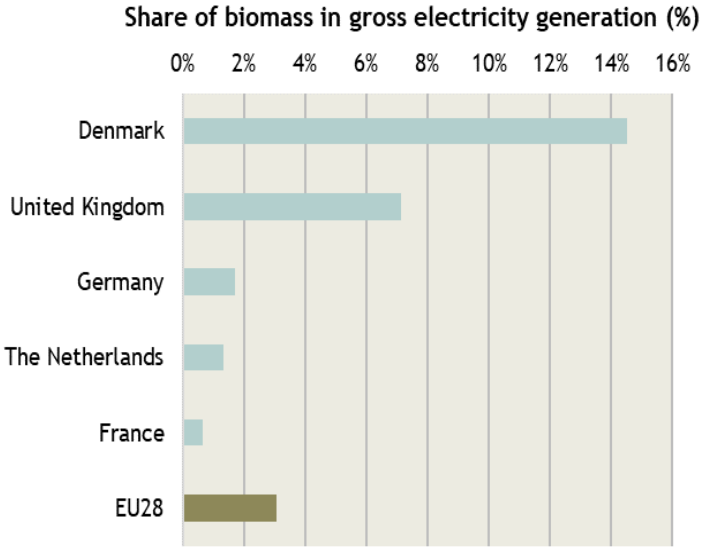
Figure 2-2 Solid biomass inputs for electricity generation and combined heat and power for 2005-2018 (PJ)

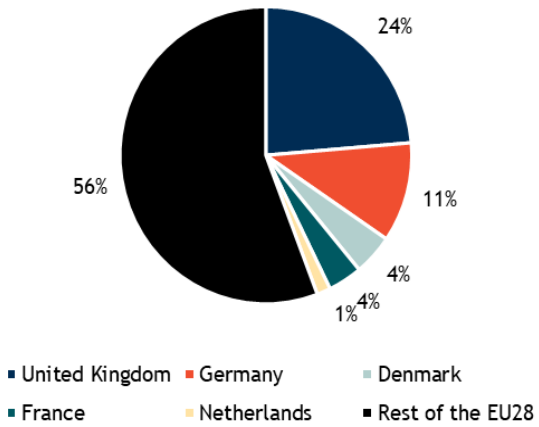


2.2.2 *Use of solid biomass in electricity generation*

Regarding the share of the overall electricity generation from solid biomass in 2018 (Figure 4-4, left), Denmark ranks first with 14.5%, following by the United Kingdom with 7.1%, while the share for the EU28 is 3%. However, the ranking differs when looking at the shares of total electricity generation from solid biomass (Figure 4-4, right). In that case, the United Kingdom comes first with 24%, following by Germany with 11%. France, Denmark and the Netherlands account in total for 9% of the total electricity generation. The remainder 56% comes from the rest of the EU 28 countries.

Figure 2-3 Electricity generated from solid biomass as a share of total electricity generation in 2018 (left), and electricity generated from solid biomass in each case study country as a share of total electricity generation from solid biomass in 2018 in the five in-scope countries and the Rest of the EU (right)





Annex A - Detailed subsidy list and sources

Table A-1 Detailed subsidy list and sources

Country	Instrument name	Instrument type	Use	2015	2016	2017	2018	2019	Data source	Calculation approach
Netherlands	Feed in Premium for Renewable energy (MEP/SDE/SDE+) - Biomass for electricity	Feed-in premiums	Electricity & Heat	22 200 000	42 200 000	84 900 000	162 500 000	216 000 000	https://www.rvo.nl/subsidies-regelingen/stimulering-duurzame-energieproductie/feiten-en-cijfers/resultaten-2016; Jaarbericht SDE & MEP 2009; Jaarbericht SDE & MEP 2010; Jaarbericht SDE & MEP 2011.	N/A
Netherlands	Investment subsidy sustainable energy (ISDE)	Grants	Heat		8 536 831	28 739 220	28 728 000	25 700 000	http://www.rijksbegroting.nl/2015/verantwoording/jaarverslag,kst221658.html; Vaststelling van de begrotingsstaten van het Ministerie van Economische Zaken (XIII) en het Diergezondheidsfonds (F) voor het jaar 2017	N/A
Netherlands	Energy Investment rebate (EIA) - Energy saving technologies	Tax allowance	Any	476 771	223 669	88 874	464 611	309 919	EIA annual reports	N/A
France	Heat Fund	Grants	Heat	98 496 000	94 146 000	84 316 000	107 226 000	122 800 000	http://www.developpement-durable.gouv.fr/Presentation-generale,25 27.html	Total grants*solid biomass share

Country	Instrument name	Instrument type	Use	2015	2016	2017	2018	2019	Data source	Calculation approach
France	Compensation supplement	Feed-in premiums	Electricity				700 000	10 300 000	http://www.cre.fr/operateurs/service-public-de-l-electricite-cspe/montant#section1	N/A
France	Reduced (10%) VAT rate applicable to deliveries of firewood and related wood products	Tax reduction	Wood fuel	112 460 000	128 500 000	132 730 000	134 000 000	134 000 000	http://www.legifrance.gouv.fr/affichTexte.do;jsessionid=D2371B19354272D696BF93227752BD8.tpdjo16v_3?cidTexte=JORFTEXT813882&dateTexte=	2019 value is an estimate based on 2018
France	Feed-in tariffs - other RES (non solar, non wind)	Feed-in tariffs	Electricity	375 724 350	457 524 116	445 323 473	523 400 000	574 200 000	https://www.cre.fr/Documents/Deliberations/Decision/evaluation-cspe-2021	2015-2017 values estimated from 2018-2021 biomass share of total renewables
Germany	EEG feed-in tariff and premium for biomass	Feed-in tariffs	Electricity	1 654 124 486	1 658 808 510	1 558 616 170	1 532 415 628	1 556 812 367	Official documentation on compensation and differential cost of the EEG from the Ministry for the Economy and Energy: http://www.erneuerbare-energien.de/EE/Redaktion/DE/Downloads/eeg-in-zahlen-xls.html	Adjusted values of EEG for solid biomass share based on solid biomass share in bioenergy electricity production
Germany	CHP feed-in tariff from biomass and waste (KWK Umlage)	Feed-in tariffs	CHP	18 159 594	26 446 084	27 950 464	23 239 048	19 315 671	Annual KWKG Accounts from TSOs: https://www.netztransparenz.de/KWKG/Jahresabrechnungen	Split subsidy amount to biomass from total biomass + biogas on basis of electricity production shares
Germany	Reduced VAT tariff for wood	Exempt. & reduct.-VAT	Wood pellets	52 725 000	57 000 000	59 850 000	62 700 000	66 975 000	Database Bioenergy Germany: https://www.fnr.de/fileadmin/Projekte/2020/Mediathek/broschu	Subsidy for wood pellets multiplied

Country	Instrument name	Instrument type	Use	2015	2016	2017	2018	2019	Data source	Calculation approach
	pellets and firewood	(related to energy use)							ere_basisdaten_bioenergie_2020_web.pdf	with the wood pellet use
Germany	Promotion of single measures for the use of renewable energy	Grants	Heating & Cooling	134 420 000	181 805 000	158 470 000	135 720 000	213 265 000	22./23./24./25./26./27. subsidy report published by the German federal government: http://www.bundesfinanzministerium.de	65% share of solid biomass out of the total renewable warming sources multiplied by the subsidies
Denmark	Promotion of Renewable Energy Act, nr. 356 04/04/2019 - solid biomass	Feed-in premiums	Renewable energy	54 999 490	63 717 587	85 096 304	79 494 022	103 906 400	Ministry of tax https://www.skm.dk/aktuelt/publikationer/%C3%B8vrige-publikationer/afgifts-og-tilskudsanalysen-paa-energiomraadet-delanalyse-2-omkostninger-til-offentlige-forpligtelser/ Danish Energy Agency https://ens.dk/service/fremskrivninger-analyser-modeller/basisshyfremskrivninger https://ens.dk/sites/ens.dk/files/Analyser/20180501_notat_til_offentliggoerelse_-pso-fremskrivning_pba_bf2018_med_ve-andele.pdf (page 2)	N/A
United Kingdom	Domestic Renewable Heat Incentive (RHI)	Feed-in tariffs	Heat	49 351 919	59 467 578	53 713 405	55 606 669	59 694 977	https://www.ofgem.gov.uk/data-portal/amount-domestic-rhi-	N/A

Country	Instrument name	Instrument type	Use	2015	2016	2017	2018	2019	Data source	Calculation approach
	payments - biomass								payments-made-under-each-tariff	
United Kingdom	ROCs - Fuelled	RES quotas with tradable certificates	Electricity	878 038 095	794 665 800	706 893 397	822 041 426	946 708 145	OFGEM annual reports and https://www.ofgem.gov.uk/environmental-programmes/ro/contacts-publications-and-data/public-reports-and-data-ro	Total ROCs "fuelled" value divided by share of solid biomass production of total bio energy production
United Kingdom	Non-domestic renewable heat incentive	Feed-in tariffs	Heat	277 508 092	382 326 682	448 886 150	555 424 900	636 964 715	https://www.ofgem.gov.uk/environmental-programmes/non-domestic-rhi/contacts-guidance-and-resources/public-reports-and-data	N/A
United Kingdom	Contracts for difference	Sliding Feed-in premiums	Electricity	0	12 535 272	283 045 510	447 753 577	465 461 002	https://www.lowcarboncontracts.uk	N/A
United Kingdom	Climate change levy (CCL) Exemption of electricity generated from certain renewable resources	Exempt. & reduct.- Energy tax	Electricity	130 814 589	74 423 456	16 643 292	845 206	0	https://www.ofgem.gov.uk/environmental-programmes/about-climate-change-levy-exemption	Use of the percentage of certificates granted for biomass to calculate the percentage of the subsidy used for biomass.

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