CARBON LEAKAGE ASSESSMENT FOR THE LUCERNE (ALFALFA) SECTOR

FINAL REPORT

22 MAY 2018

REFERENCE: 203215

CITEPA

COOP DE FRANCE déshydratation

ECOFYS

A Navigant Company

TRADE INTENSITY OF ALFALFA IS DECLINING IN THE EU WHILE IT IS CONSTANT IN FRANCE

Trade intensity

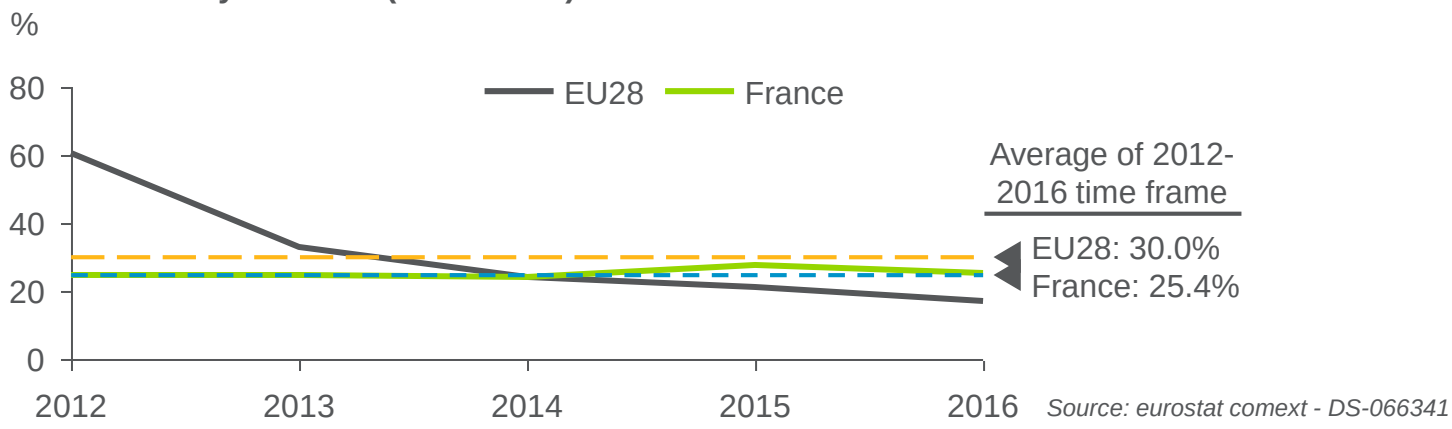
$$\textbf{\textit{Trade intensity}} = \frac{Value\ of\ traded\ products}{Total\ market\ volume} = \frac{Import\ value\ +\ export\ value}{Import\ value\ +\ production\ value}$$

Calculated according to default methodology

Our calculations for trade intensity are in line with the default methodology of the guidance document

- Trade intensity is calculated with publicly available data (Eurostat)
- Data from 2012-2016 is available for the lucerne/alfalfa PRODCOM
- 2012 spike in EU trade intensity originates from very high export values
- The entire time series (2012-2016) is used for the CL calculations as required by the default methodology described in the guidance document (which requires “data for the five most recent years”)
- Eurostat indicates values of 0 for production, exports and imports in the 3 EEA countries NO, LI, IS

Trade intensity of alfalfa (10.91.20.00) in the EU28 and France

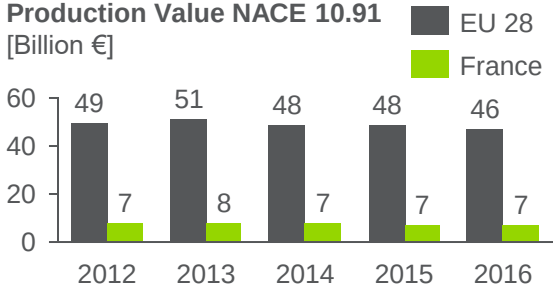


Source: eurostat comext - DS-066341

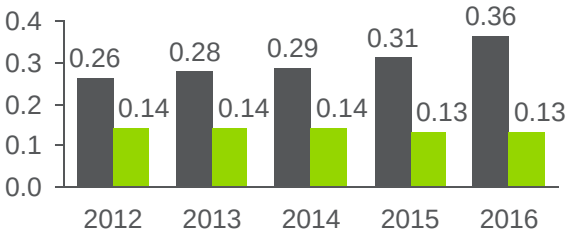
GVA ON PRODCOM LEVEL IS ESTIMATED USING PUBLICLY AVAILABLE GVA DATA ON NACE LEVEL

Direct & indirect emission intensity

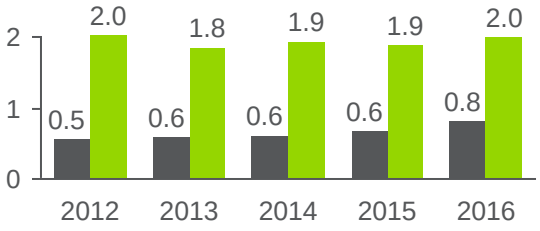
Production Value NACE 10.91
[Billion €]



Production Value Alfalfa
[Billion €]



Alfalfa share of production values in NACE 10.91 [%]



Source: eurostat comext - DS-066341

Gross value added (GVA) is required for both direct & indirect emission intensity

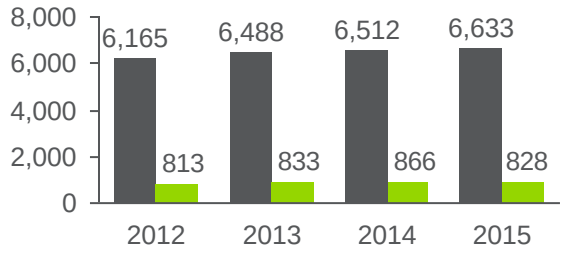
$$\textit{Emission intensity} = \frac{Emissions}{GVA}\left[\frac{kg\ CO_2}{€\ GVA}\right]$$

Calculated according to default methodology

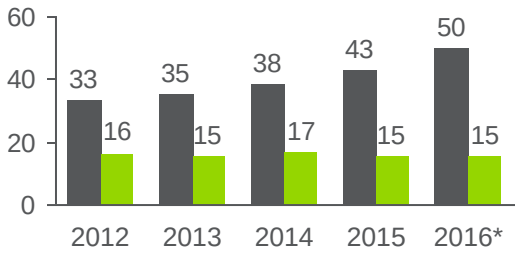
- GVA is not available on Eurostat on 8-digit PRODCOM level but only on 4-digit NACE level
- The published guidance provides a methodology to estimate PRODCOM level GVA data using NACE level data:
  1. Calculate the PRODCOM's (10.91.20.00) share of production value in its corresponding NACE code (10.91)
  2. Apply this share to the NACE code's GVA

GVA NACE 10.91
[Million €]

Source: eurostat [sbs_na_ind_r2]



Constructed GVA alfalfa
[Million €]



**2016 GVA is forecasted using the correlation of GVA development to production value development*

DIRECT EMISSIONS ARE ASSUMED TO OCCUR ONLY IN FRANCE – CONSERVATIVE APPROACH

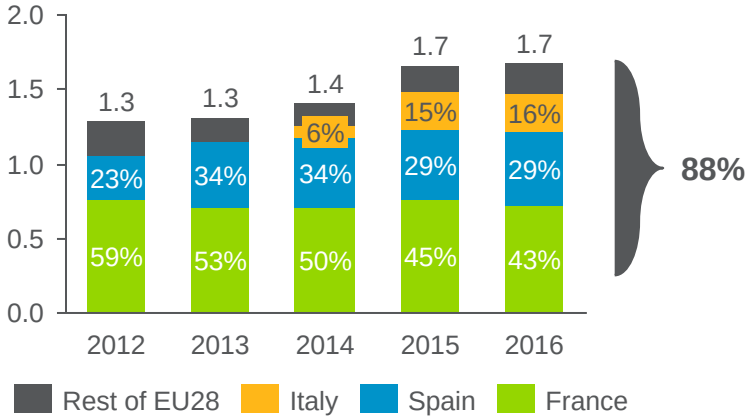
Direct emission intensity

Direct CO_2 emissions in the EU are assumed to consist only of those occurring in France

- The majority of the rest of production in the EU takes place in Spain and Italy (FR, IT, ES combined produced 88% in 2016)
- Italian and Spanish producers largely use solar radiation in their drying processes instead of fossil fuels
- This is a conservative approach as it likely underestimates total direct emissions
- For their assessment, the EC only considers ETS emissions, which we do as well in our calculations (96-97% of French emissions)
- All French ETS-installations combined emit on average 286 kt CO_2 annually, which we use as an approximation for total EU 28 emissions

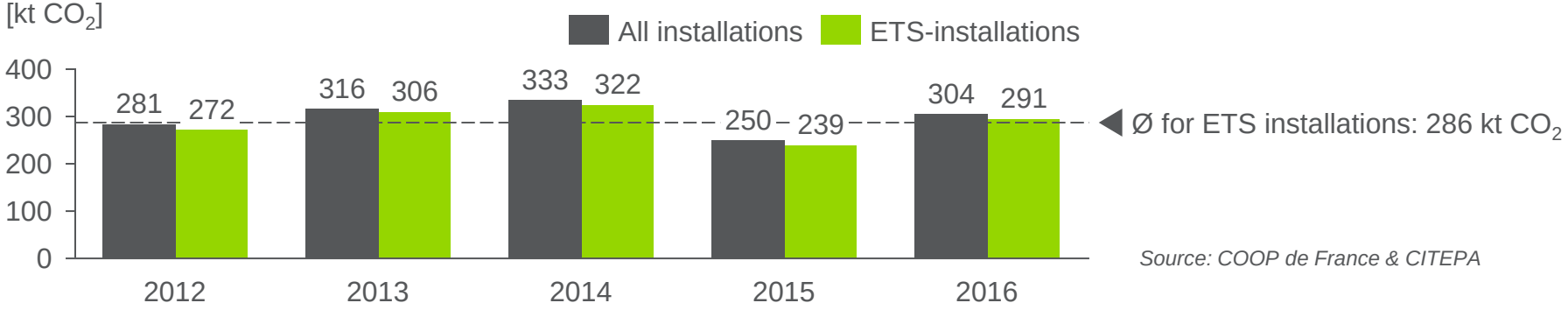
Production quantities in the alfalfa sector
[Mt]

Extrapolated using French sector input



Source: eurostat comext - DS-066341

Direct CO_2 Emissions of French alfalfa plants
[kt CO_2]



Source: COOP de France & CITEPA

ELECTRICITY CONSUMPTION OF THE SECTOR ON EU LEVEL CAN BE ESTIMATED USING FR DATA

Indirect emission intensity

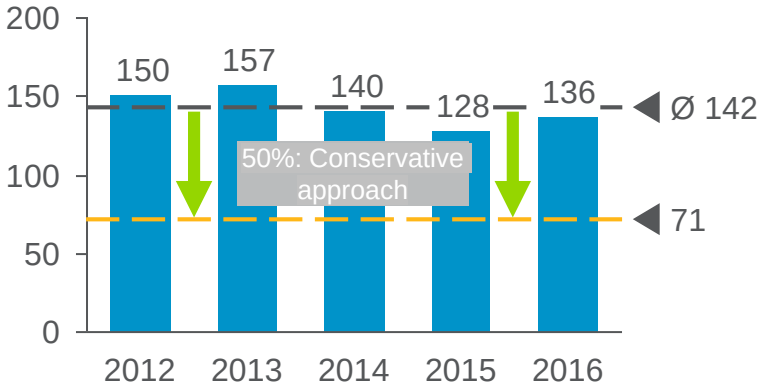
Electricity consumption of alfalfa production is assumed to be of similar structure in other European countries

Extrapolated using French sector input

- Power consuming processes such as grinding and pressing are similar all over Europe
- To correct for electricity consumption of the thermal drying process, we assume that other countries only require 50% of the electricity. This leads to a conservative approach
- Key input: Analysis by Schneider Electric of energetic optimisation in biomass drying processes (2012)

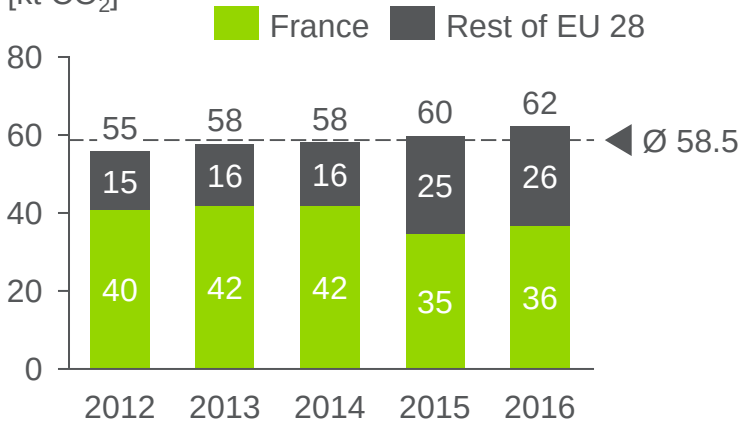
- Average French specific electricity usage of 142 kWh/t of production is used to extrapolate to the rest of Europe: 50% * 142 kWh/t of production = 71 kWh/t of production
- Updated electricity emission factor of 0.376 t CO_2/ MWh electricity
- French producers do not operate any CHPs that could delude electricity consumption figures

Electricity usage per ton of production in French alfalfa plants
[kWh/t alfalfa]



Multiply with production figures & electricity emission factor

Estimated indirect emissions in the EU 28
[kt CO_2]



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