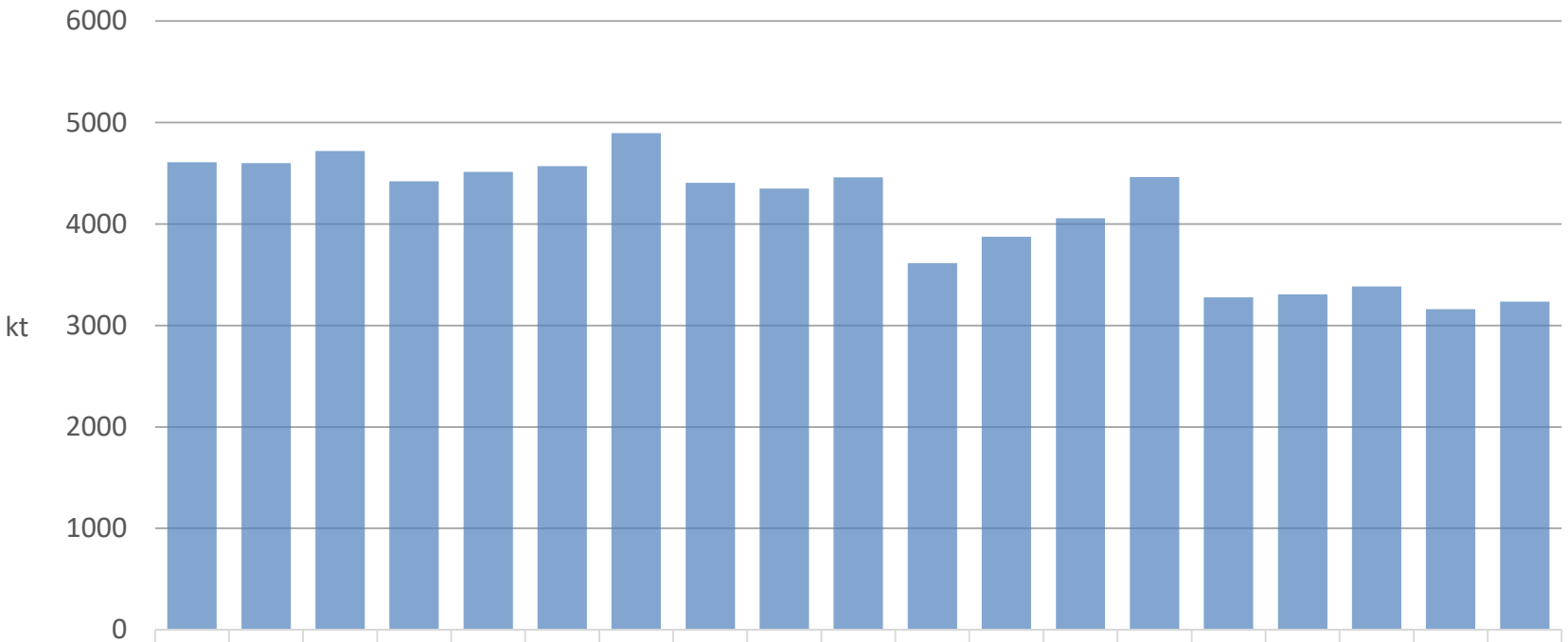
Assemblée de Section 2016

Rapport d'activité

COOP de FRANCE Déshydratation

Palais des Congrès - Paris| 15 décembre 2016

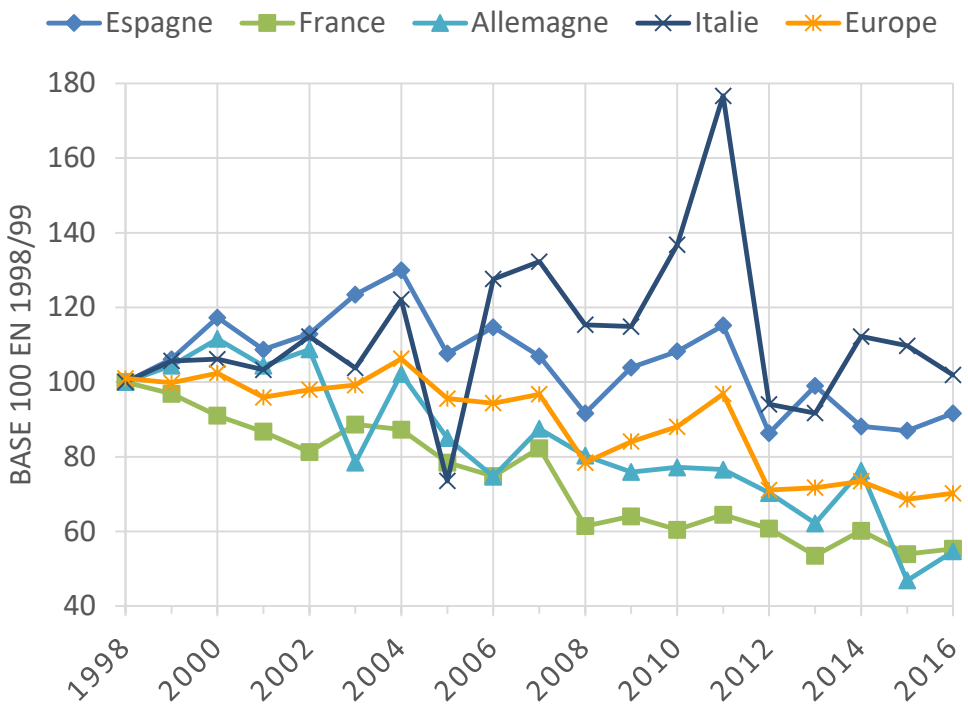
LA PRODUCTION DE FOURRAGES SECHES en EUROPE: TENDANCES (kt)



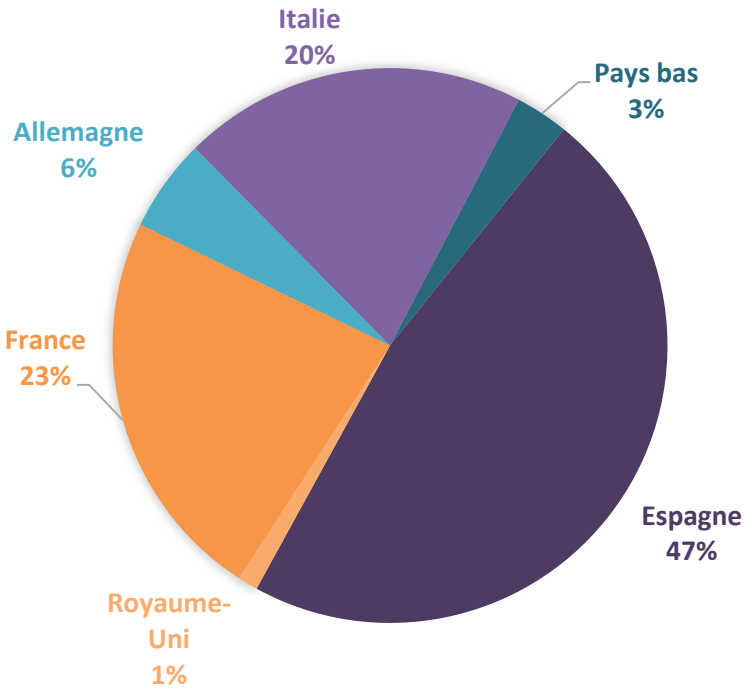
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total en kt	4609	4599	4720	4421	4515	4571	4897	4405	4348	4459	3616	3874	4058	4463	3277	3306	3385	3161	3236

Europe: évolutions et parts relatives

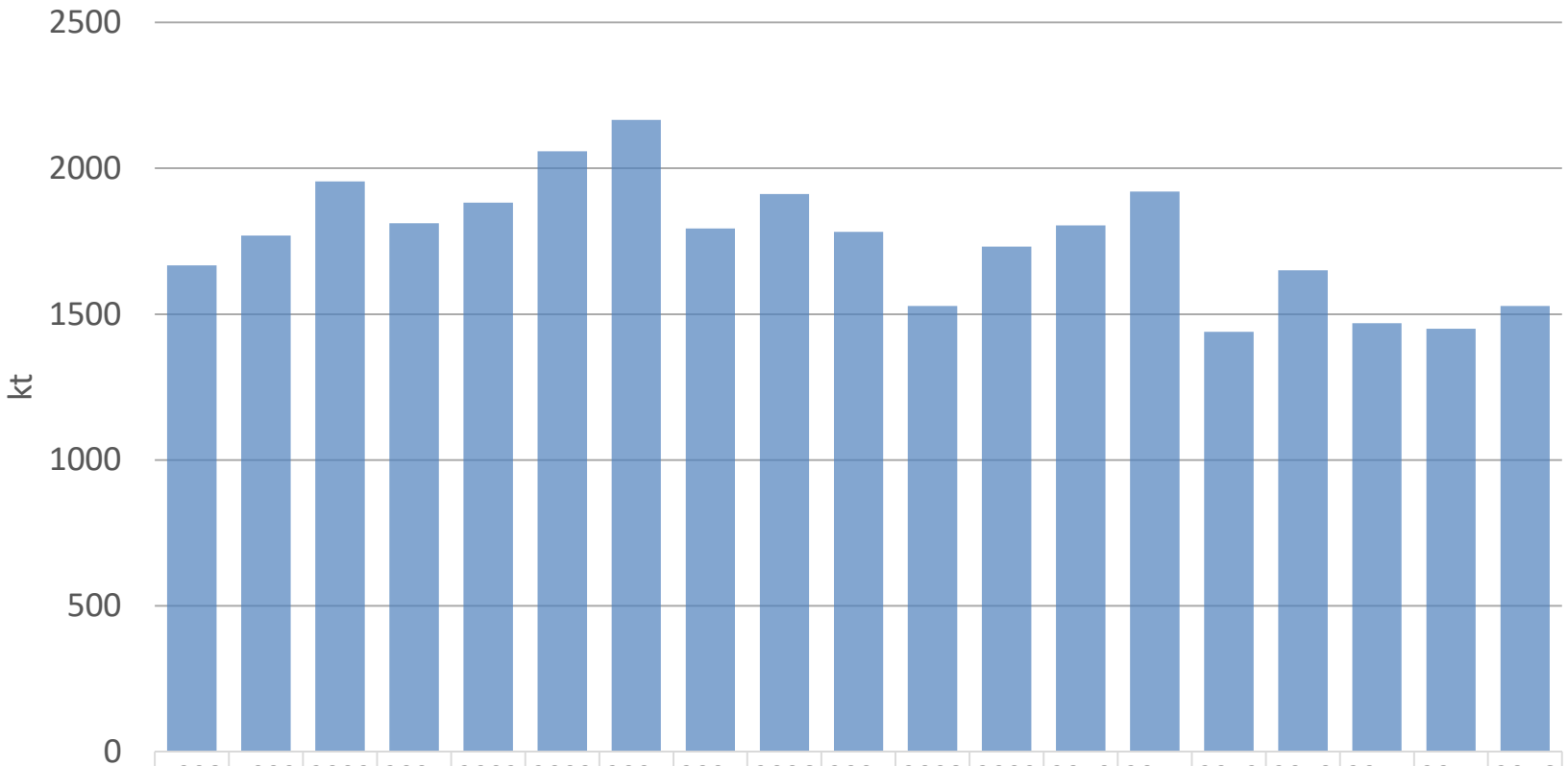
EVOLUTION RELATIVE DE LA PRODUCTION DES 4 PRINCIPAUX PRODUCTEURS EUROPÉENS DE FOURRAGES DÉSHYDRATÉS



CAMPAGNE 2016: DISTRIBUTION DE LA PRODUCTION EUROPÉENNE DE FOURRAGES SÉCHÉS PAR PAYS

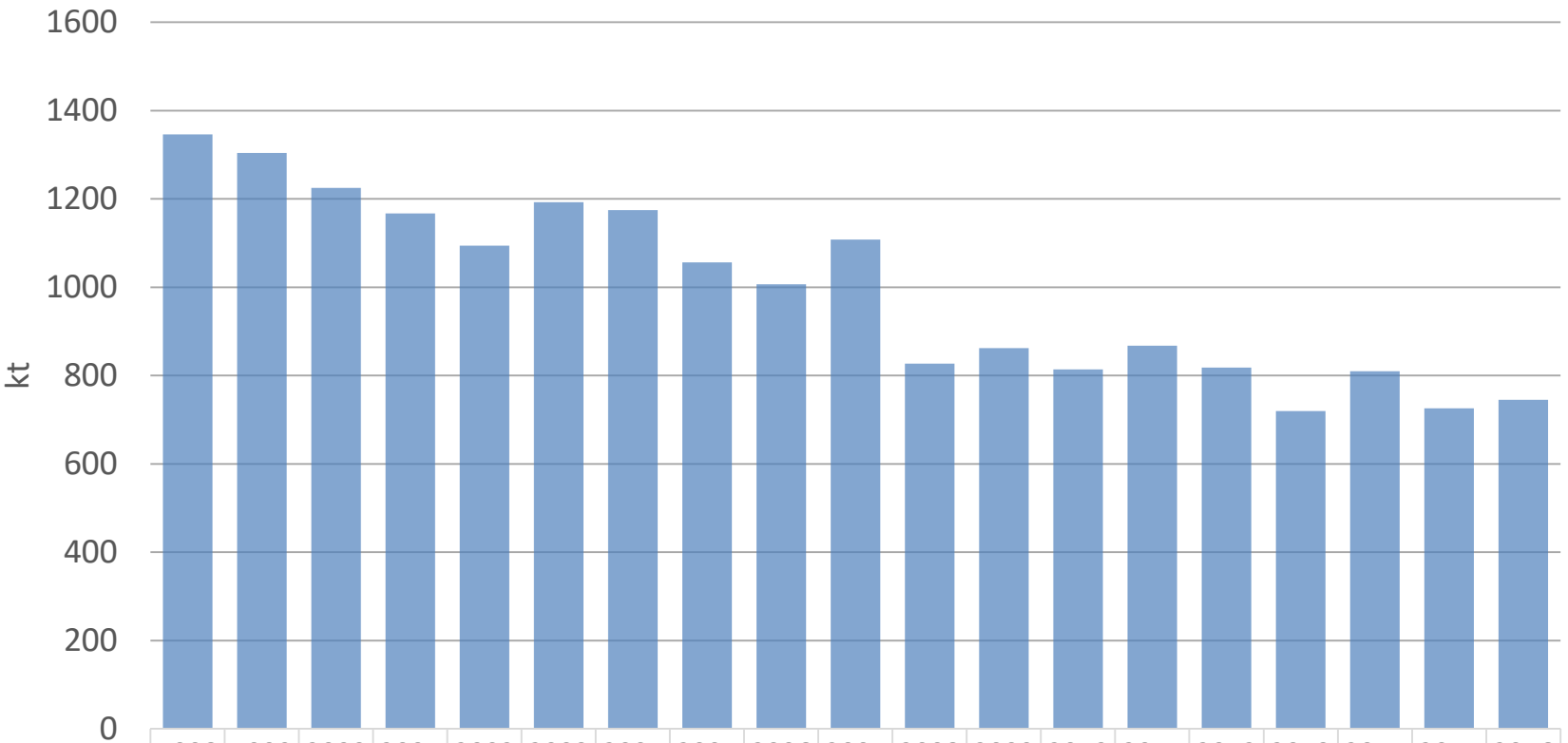


ESPAGNE : EVOLUTION DE LA PRODUCTION DE FOURRAGES SECHES (kt)



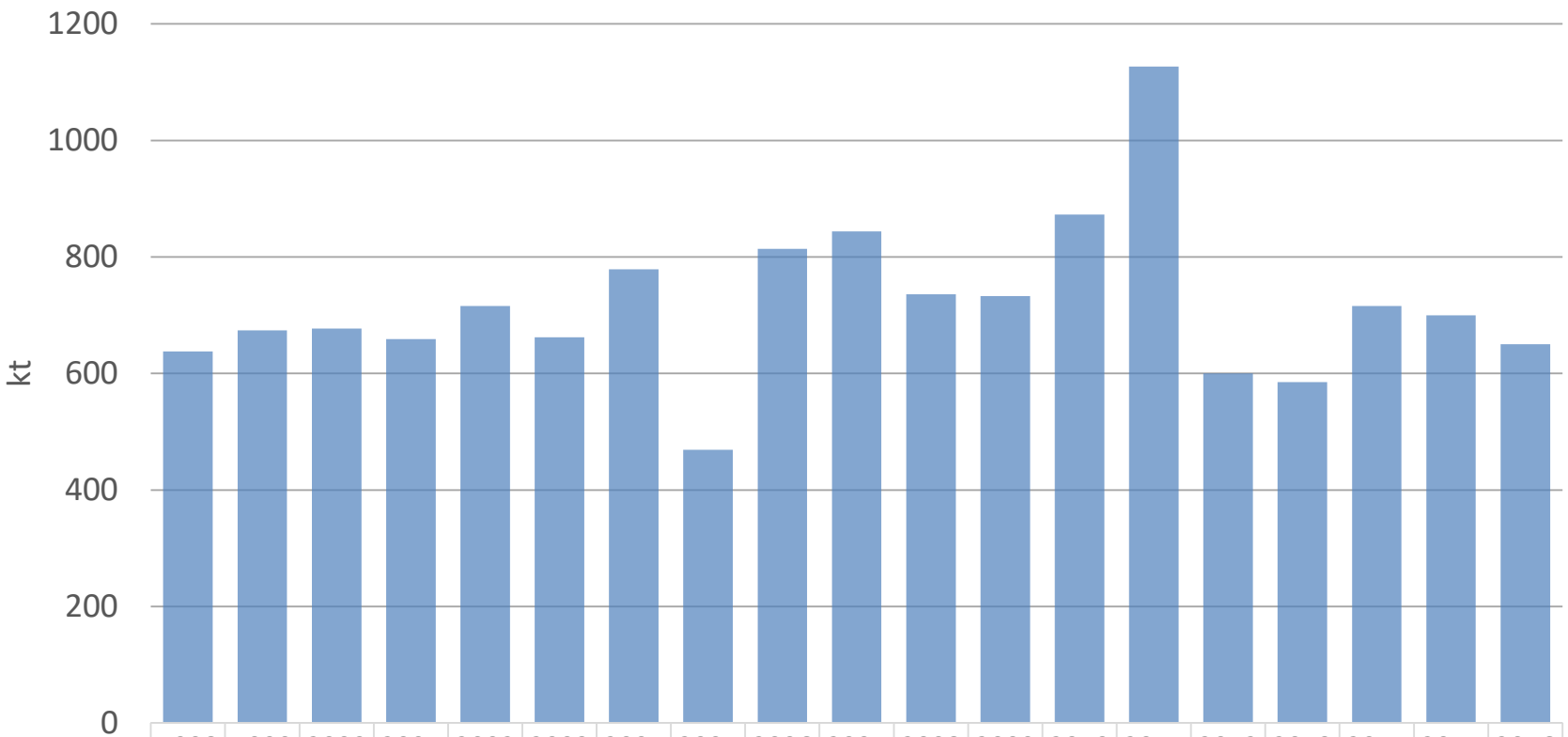
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total en kt	1667	1769	1955	1812	1882	2058	2166	1794	1912	1782	1528	1732	1804	1920	1439	1650	1469	1450	1528

FRANCE: EVOLUTION DE LA PRODUCTION DE FOURRAGES SECHES (kt)



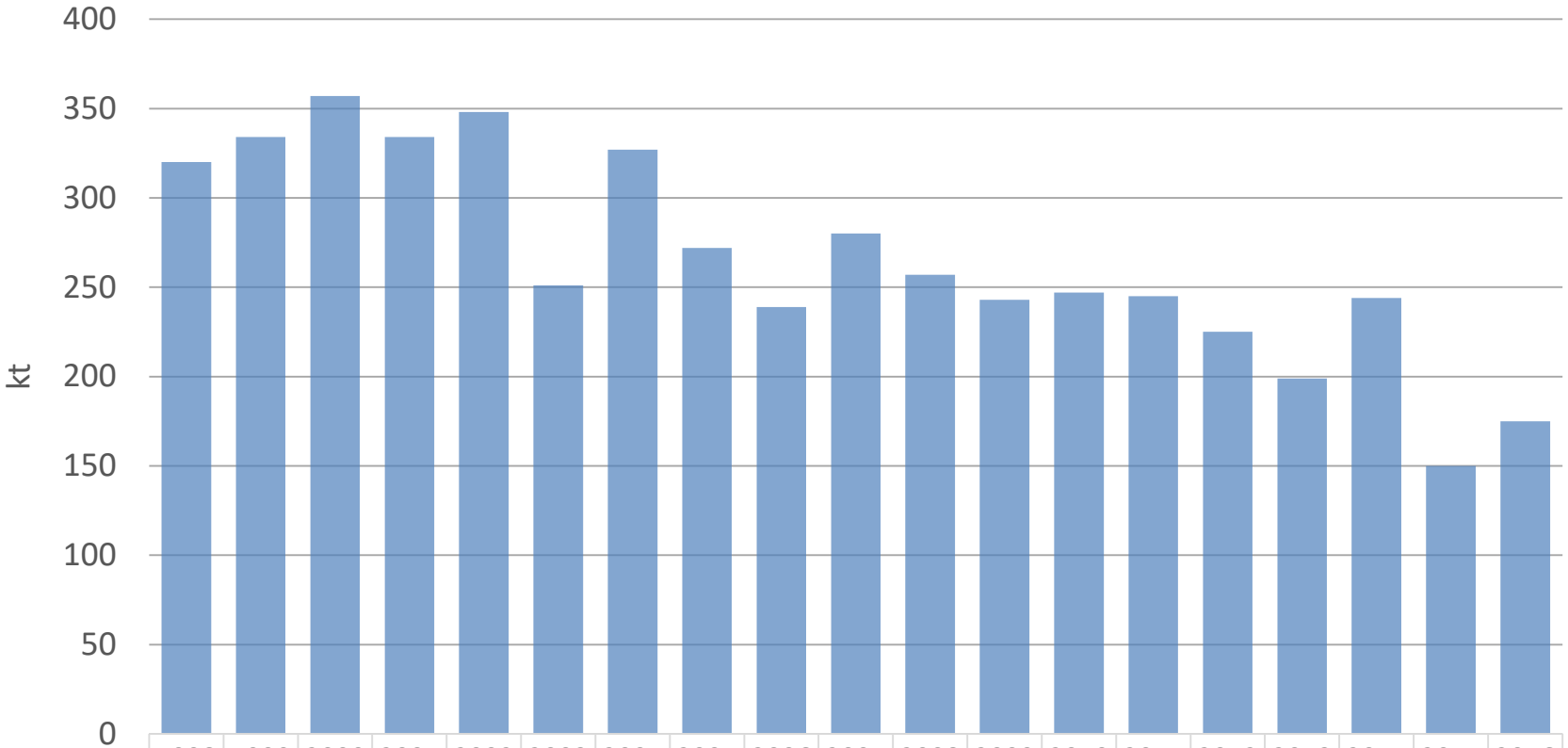
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total en kt	1346	1304	1225	1167	1094	1193	1175	1056	1007	1108	827	862	814	868	818	720	810	726	745

ITALIE: EVOLUTION DE LA PRODUCTION DE FOURRAGES SECHES (kt)



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total en kt	638	674	677	659	716	662	779	469	814	844	736	733	873	1127	600	585	716	700	650

ALLEMAGNE: EVOLUTION DE LA PRODUCTION DE FOURRAGES SECHES (kt)



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total en kt	320	334	357	334	348	251	327	272	239	280	257	243	247	245	225	199	244	150	175

Comité Exécutif Recherche Agronomique

CERA

Le CERA compte 18 membres :

- **Aurélie OLIVIEIRO**, *Responsable agro UCDV*
- **Benoit CHORRO,** *Responsable développement durable* DUREPAIRE/OCEALIA
- **Damien LARBRE**, *Conseiller spécialisé luzerne, Chambre d'agriculture Marne*
- **Didier COULMIER**, *Directeur R&D Désialis*
- **Didier MAUFFROY**, Vice-président du CERA, agriculteur dans l'Aube, administrateur *CAPDEA*
- **Eric GUILLEMOT**, *Directeur COOP DE FRANCE Déshydratation*
- **François GASTAL**, *Directeur Unité de Recherche Pluridisciplinaire Prairies et Plantes Fourragères INRA LUSIGNAN*
- **Hervé PACQUETET**, *Directeur adjoint TEREOS Nutrition Animale*
- **Marie NIESS,** *Chargée de relations adhérents CAPDEA*
- **Mylène MAUDIER,** *Chargée de relations adhérents TEREOS Nutrition Animale*
- **Olivier MORANT,** *Administrateur TEREOS Nutrition Animale*
- **Philippe GRATADOU**, *Union Française des Semenciers, Directeur Produits JOUFFRAY-DRILLAUD*
- **Régis BERTHELOT**, *Direction scientifique Arvalis*
- **Rémy LORIN**, *Chargé de relations adhérents SUN DESHY*
- **Romain CARPENTIER,** *Chargé de relations adhérents Coopédom*
- **Romain JOYA**, *Ingénieur conseil COOP DE FRANCE Déshydratation*
- **Stéphanie MORET**, *Responsable des performances industrielles et agro, LUZEAL*
- **Claude PANNET**, Président du CERA, agriculteur dans la Marne, administrateur *SUN DESHY.*

- Depuis octobre 2012, le CERA est présidé par Claude PANNET, agriculteur à Marson (51), administrateur de SUN DESHY.
- Didier MAUFFROY est Vice-président depuis septembre 2014.

Dossiers 2016

CERA

- Organisation: comité plénier + sous groupe *ad-hoc*.
- GT-Désherbage:
  - Proposer de nouvelles pratiques de gestion de l'enherbement dans les luzernières (essais d'associations avec du trèfle traçant, test produits de bio-contrôle, binage optique),
  - Etudier la luzerne comme un outil de gestion de l'enherbement des rotations (vulgarisation de travaux INRA)
- GT-FERTILISATION: essais fertilisation soufrée et potassique.
  - Fin de trois années d'expérimentation. Place à la valorisation (auprès des agriculteurs et de la communauté scientifique).
- Communication agronomique
  - Journée Technique et circulaires,
- AGROLUZ+: enquête 2015 sur la campagne 2016.
  - Comparatif personnalisé en ligne + publication d'un rapport de synthèse.

Comité Exécutif Nutrition Animale

CENA

- **Le CENA compte 12 membres :**
  - Aurélie OLIVIERO, UCDV
  - Alexis FERARD, ARVALIS
  - Benoit CHORRO, DUREPAIRE/OCEALIA
  - Benoit ROUILLE, IDELE
  - Charles ADRIAN, NEALIA
  - Cyril LECHARTIER, ESA ANGERS
  - Christophe BESANÇON
  - Didier COULMIER, DESIALIS
  - Eric GUILLEMOT, COOP de FRANCE
  - Philippe DETERM (ex-NEALIA)
  - Philippe ETIENNE (administrateur COOPEDOM)
  - Romain JOYA, COOP de FRANCE
  - Samuel MAIGNAN, COOPEDOM

Dossiers 2016

CENA

- DESHY 2020: contribution importante du CENA.
- Le marche de la luzerne en alimentation équine
- Mise a jour et harmonisation des valeurs alimentaires de la luzerne chez les ruminants
- Perception de la luzerne déshydratée en élevage bovin laitier
- Essai ration inversée: tester des rations à moins de 1kg de tourteau par vache laitière et par jour en se basant sur du maïs épi et de la luzerne.

COMITÉ EXÉCUTIF TECHNIQUE

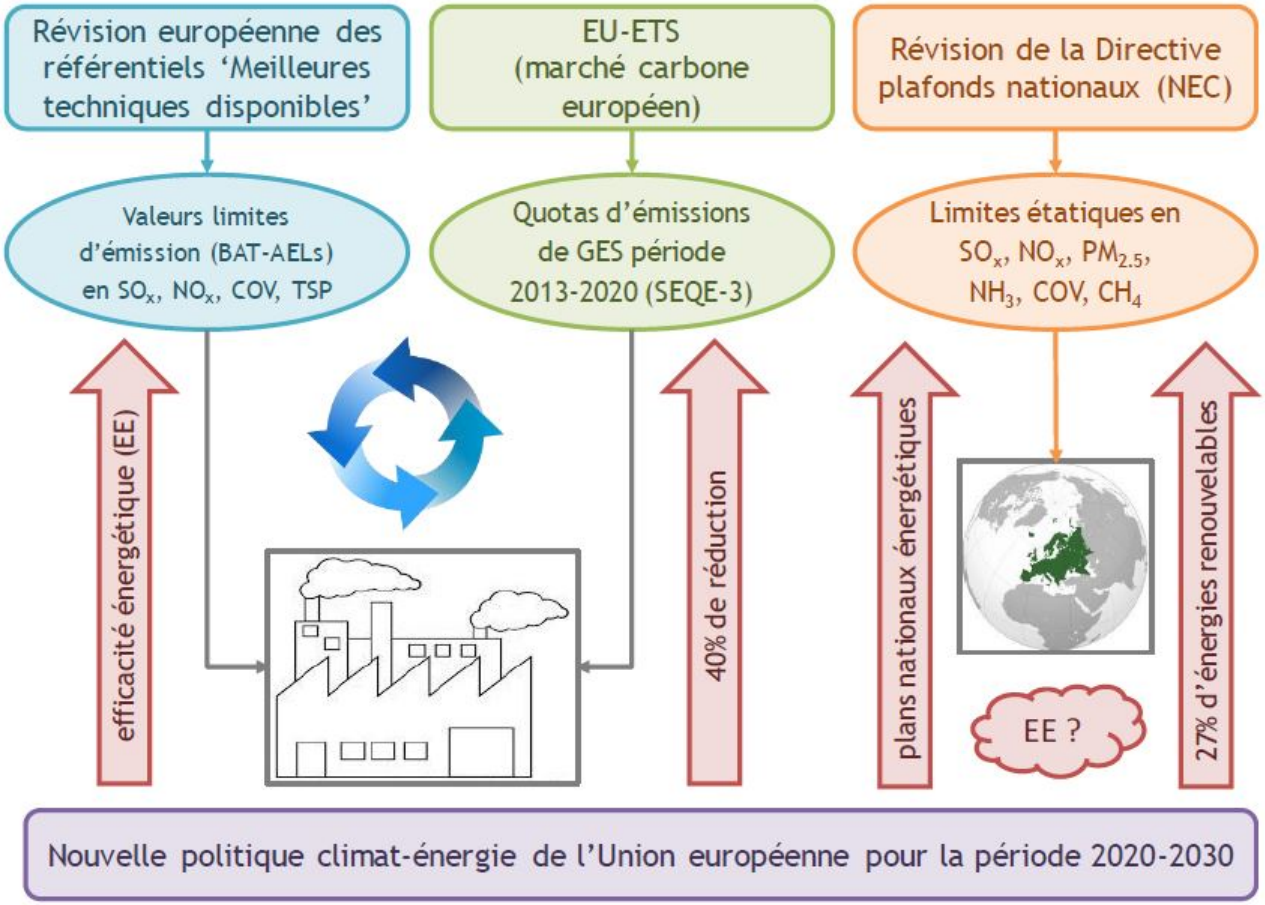
Le CET intervient en support aux conditions d'exploitation des usines de la filière, notamment liées aux réglementations nationales et européennes.

Il s'appuie sur les compétences techniques de *COOP de FRANCE Déshydratation,* de ses membres adhérents et d'organismes tiers pour interagir avec l'Administration.

CET

Le CET compte 16 membres :

Frédéric ANDRÉ, *COOPEDOM*
Jean-Marie BÉLIÈRES, *SIDESUP*
Christophe BESANÇON, *SUN DÉSHY*
Hervé GRASER, *CRISTAL UNION*
Eric GUILLEMOT, *COOP DE FRANCE*
Thierry HAMEREL, *LUZEAL*
Pascal HAMON, *CRISTAL UNION*
Jean-Louis JOLIVET, *APM DÉSHY*
Thomas LAVENU, *UCDV*
Yann MARTINET, *COOP DE FRANCE*
François-Xavier MOONS, *CAPDEA*
Hervé PACQUETET, *APM DÉSHY*
Denis PINOIT, *GRASASA*
Etienne PLANCQ, *LUZEAL*
Christophe SEGRÉTAIN, *CODEMA*
Ludovic VERVAEKE, *SUN DÉSHY*



Poursuite du programme défini en 2013 : enquête nationale de production de la filière

Premier volet en cours d'achèvement : la filière est identifiée dans le référentiel européen des Meilleures Techniques Disponibles (MTD)

- reconnaissance technique, définition des futurs permis d'exploiter ;

Deuxième volet achevé : intégration de l'inventaire national des émissions :

- reconnaissance statistique auprès de la CE et des Nations unies ;

Troisième volet en cours : obtention du statut de fuites de carbone dans le cadre de la révision de l'ETS post-2020.

- en s'appyant sur la double reconnaissance européenne : industrielle et statistique, réglementation en cours de négociations.

Best Available Techniques in the sector for industrial production of green fodder

Yann Martinet[1]

[1] *TWG industry expert member, COOP de FRANCE Déshydratation, France.*

The industry producing green fodder is operating in rural areas, with market demand. Spain is the leading European producer of dehydrated alfalfa, the main production in the sector, ahead of France and Italy. The French sites stand out for their high combustion capacities, the weather limiting the drying potential of the fodder in the fields before it is processed in the plants. Seventeen are classified under the heading *6.4 b) treating and processing for the purpose of manufacturing food products or animal feed ii) only from vegetable raw materials, with a production capacity greater than 300 tons of finished products per day*, some exceeding the threshold of 50 MW of installed capacity. However, direct flame combustion being directly used to process incoming material, these generators are not dealt with in the BREF related to large combustion facilities.

The choice of these hot air generators is historic and most of these plants were set up in the 1960s under the legal form of farming cooperatives. They are therefore owned by their member farmers that manufacture a large number of products: alfalfa, other leguminous plants, grasses, other green fodder, corn, poppy seeds, carrots, straw, unripe hay, etc. Most of the sites also handle by-products from nearby industries in order to extend the campaign for a longer time and make better use of their production tools: sugar beet pulp with the sugar industry, grape marc with distilleries, pomace with cider producers, mustard bran with mustard producers. Some even operate during the winter campaign, using sawdust, miscanthus, short rotation bushes to manufacture agro-fuels.

A sector that has synergies with other food processing industries

Before any in-depth analysis of the dehydration process in the sector for industrial production of green fodder and its technical-economic constraints, it should be positioned within the overall context of the food processing industries *(see figure 1)*.

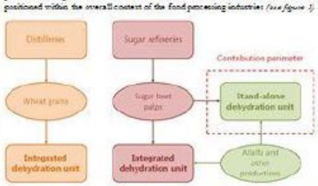


Figure 1 *Position of the stand-alone dehydration units in the food processing industries.*

The fodder dehydration units are called stand-alone, in the sense that they handle alfalfa from April-May until October regardless of the operating levels of other industries. The crops are purchased on site and the farming sites continuously supply the units. Since the sugar refineries close down in this period, it is commonplace for a part of the fodder to be processed in an integrated dehydration unit on site to prevent any overuse of industrial equipment.

When the sugar production campaign begins in the autumn, the sugar beet pulp is partly processed in a dehydration unit installed at the sugar refinery in order to recycle the residual heat, while the surplus is sent to a stand-alone dehydration unit whose alfalfa campaign is coming to an end. This synergy enables both the stand-alone units to operate until the end of the calendar year and the integrated units to start up at the beginning of the summer campaign. From an economic standpoint, the sugar production campaign is indispensable for the profitability for the sector of industrial promotion of fodder. For 750,000 tons of dehydrated alfalfa produced, about 500,000 tons of sugar beet pulp are processed.

Field sites integrated in industrial logistics

The improvement of operating stand-alone dehydration units involves controlling their supplies. In order to ensure the unit operates as regularly as possible and to reduce the number of incidents or stoppages, which are always costly, harvesting in the alfalfa fields takes place during the periods the units are operating, in other words round-the-clock. The first stage on a field site is mowing the alfalfa. Until recently, it was placed in rakes then gathered afterwards to conserve product quality, the average humidity rate of which was hence reduced from 80% to 75% when entering the unit. Apart from the harvesting constraint this implied, such practice reduced the drying capacity of sun-dried products. Therefore an intermediary stage has been included in the process in the form of flat pre-wilting that needs maintenance of the farming machinery used for such purpose, *i.e.* rakers *(see figure 2)*. The mowed alfalfa is lifted up from underneath by rakes that spread it over a rolling belt that expels it out of the machine to the sides. The alfalfa is then spread flat over the field, its drying being better due to the larger surface specifically exposed to the sun. The silage is then carried out 24 to 48 hours after the cutting process, depending on the weather conditions and the units needs for supplies. This flat pre-wilting technique does not lower the quality of the finished product and enables up to 30% energy saving to be achieved by the unit due to the lower humidity level of input products *(see annex 1)*.

Figure 2 *A rake operating on a plot of land with mowed alfalfa in french county of Champagne-Ardenne.*

There is such a substantial energy saving that this technique is generally used in all the fields and this occurs in spite of an additional process being included between the mowing and silage of the products. However, this system cannot be used for dehydration by wet process *(see below)*.

Dehydration by dry process at high temperature

The high-temperature drying process consists of producing dehydrated alfalfa pellets or bales with 10% to 12% humidity using raw material with humidity that varies from 25% to 80%, depending on the treatment it is given in the fields and the humidity conditions at the time of harvesting. It is also used for other kinds of fodder. The alfalfa, pre-wilted in the field, is dried at a high temperature in one- or three-pass rotary furnaces *(see annex 2)*. In France, high temperature drying is normally carried out in three-pass rotary drums *(see figure 3)*. The shorter three-pass rotary drums are adapted to high humidity levels because the passes through the drum are more frequent, the exchange volumes being greater. They are fed with heat from the grill burners. The fuel used is coal, lignite, gas and more recently some kinds of biomass as wood chip, sawdust or miscanthus *(see annex 3)*.

Figure 3 *Three-pass drying drum on the SUN DÉSHY dehydration site of Saudoin.*

The furnace pipe temperatures vary according to the humidity of the incoming products and vary between 300°C and 930°C depending on the product in question. When coming out of the drum, the temperature of the output fumes is about 120°C. Fodder is dehydrated with surplus air, in particular for the purpose of creating a flow to allow its correct circulation in the dryer. The oxygen content of dry gas in the effluents was about 16% in operating conditions from 2005 to 2008. However the ventilation air flow of a dryer is in constant operation to ensure the pneumatic circulation of the products. The combustion air quantity varies depending on the thermal power created. The lower the power created the greater the supplement that must be provided to the combustion air. Therefore, the increasingly greater use of flat pre-wilting since 2008 has created an increase in the oxygen output rate from the dryer so that this now reaches almost 20% for the driest incoming products. Due to the fact that these air surpluses are related to the drying process, the French authorities agreed in 2014 that an adjustment of the concentrations measured in the reference oxygen rate of 16% would not be required: the oxygen content used as a reference is the real oxygen content of undiluted combustion gas by adding non-indispensable air to the process. By doing this, any significant differences in the reference oxygen rate close to 16% must be justified.

Two of the seventeen IED sites in the sector are equipped with a wet process, four have low-temperature pre-dryers and the others are categorised as standard sites. As a national annual average, the sector hence spreads a little over 550,000 m³ of effluents *(see Figure 6)*.

In general terms, since alfalfa basically needs supplies of water and potassium, many contributions to its leguminous quality can be accepted. Similarly, recovery is possible with some digestates from methanization, even though the sector's needs for areas can be covered providing they are within these restricted quantities. For example, in Marne, where most of French production comes from, the quantities spread by the sector represent no more than 5% of the overall quantity. The strong competition for these areas thus implies a determining factor in the choice by the sector not to install gas scrubbers that would lead to increasing these quantities a great deal *(see Annex 9)*.

Therefore, high-performance cyclones and bag filters are preferred *(see Annex 10)*, in spite of the fact they do not achieve the same performance in terms of atmospheric waste. A derogation would hence allow the sector to reject up to 200 mg/m³ of dust while the trials are being conducted to eventually equip the sites with advanced cyclone systems that have increased capacities *(see Annex 11)*.

Type of site	Sites equipped with a wet process				Example of site equipped with a low-temperature pre-dryer		Examples of standard sites			
Number of sites	2				4		11			
Cooperative	APM DÉSHY		LUZEAL		LUZEAL		LUZEAL		CAPDEA	
Production sites	Aulnay-aux-Planches		Pauvres		Recy		Saint-Rémy		Marigny-le-Châtel	
Volumes spread (m³)	2012	189,023	2012	183,022	2012	18,171	2012	3,270	2012	1,992
	2013	192,335	2013	176,749	2013	37,506	2013	0	2013	5,787
	2014	206,875	2014	180,413	2014	57,288	2014	5,342	2014	7,412
Spreading areas (ha)	2012	431	2012	296	2012	33	2012	4,5	2012	40
	2013	482	2013	214	2013	32	2013	0	2013	43
	2014	531	2014	259	2014	36	2014	42	2014	60

Figure 6 *Volumes spread depending on the type of French dehydration sites: standard sites, equipped with a low-temperature dryer or a wet process.*

Choice of sites representing the sector

There are a wide range of variable criteria among the production sites in the sector, which can be categorized as follows:

- production: the use of three-pass rotating drums enables a large number of products to be dehydrated by reducing the needs to adapt the process. However, producing long-blade alfalfa bales rather than pellets needs installation of a specific mechanical press, while producing liquid protein concentrate requires installation of a dedicated line *(see Figure 7)*,
- equipment: if the flat pre-wilting is generally used on all the fields, along with three-pass rotating drums, high-performance cyclones and bag filters installed in almost all the plants, the replacement of fossil fuels with biomass or recycling of wet air from the dryer have variable structures. Moreover the low-temperature pre-dryers are only installed on some sites, whereas variable speed drives are gradually being used after implementing certified energy management systems (*e.g.* ISO 50001).

Figure 7 *Mechanical pellets and bales presses installed on the SUN DÉSHY dehydration site of Francheville.*

Taking into account these differences, two sites have been selected as the most representative of the best available techniques in the sector of industrial promotion of green fodder among the seventeen IED sites in the sector *(see Annex 12)*:

- the APM DÉSHY site in Pleurs has a line equipped with a 25 MW heavy grate coal and lignite burner. The drying drum has a unitary capacity of 30,000 l/h. Four pellet presses with joint capacity of 720 kW are installed in the system;
- the LUZEAL site in Recy has two lines equipped with 30 and 39 MW heavy grate lignite and coal burners. A glass tube pre-dryer with a unitary capacity of 6,000 l/h is supported by two drying drums with capacity of 40,000 and 55,000 l/h. Eight pellet and bale presses with a total capacity of 1.7 MW are installed in the system.

Fossil fuel is partially replaced with biomass on two sites.

Annex 1 | Flat pre-wilting of fodder

Flat pre-wilting consists of spreading the fodder flat after being mowed so that it is left to dry in the open air before being harvested. This enables the moisture content of the material to be lowered faster than by pre-wilting in windrows due to the optimised exchange surface between the sun and the product. This process is carried out using mowers and rakes specifically designed for such purpose.

Principle and operational implementation

The temperature of the hot air generator pipe, and thus the energy needed for drying, depends on the level of dry content in the input product *(see Figure 8)*.

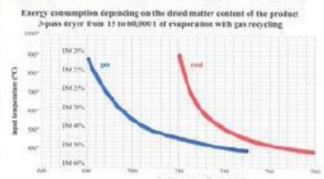
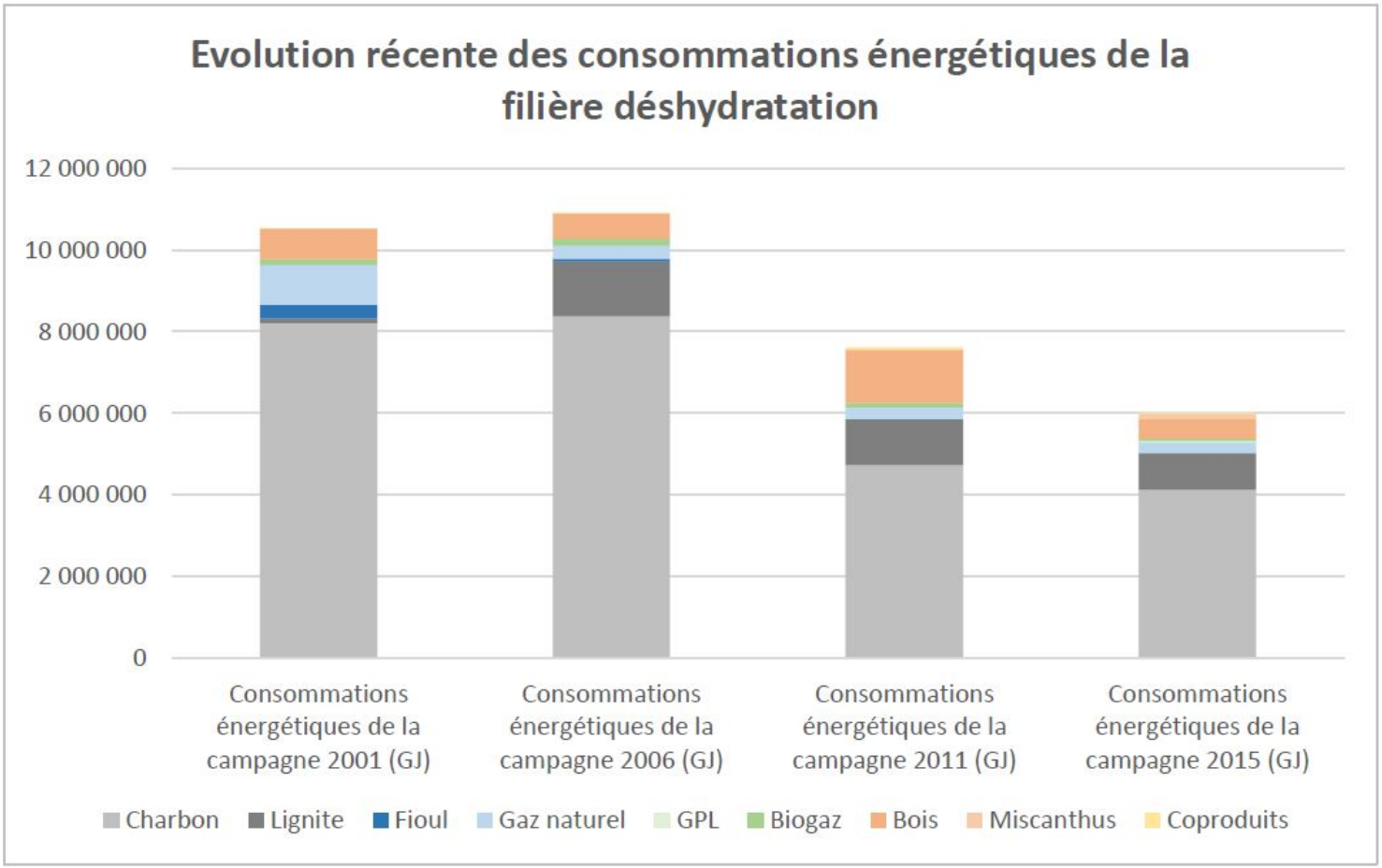


Figure 8 *Energy consumption depending on the dried content of the input product.*

Flat pre-wilting enables the humidity of alfalfa to be reduced by about 3.5%, to achieve an average fodder humidity of 71.5%, which implies energy saving of about 20% in the combustion burners *(see Figure 8)*. In addition, the unit quantity of diesel needed to transport the less humid fodder is lower. Raking, which requires specific equipment, is only practical at the time of harvesting and is not used in the mowing process. This implies an additional process is needed and therefore there are extra costs for staff, specific equipment and fuel. This equipment has been developed by international suppliers specifically for the alfalfa sector and is adapted to the intensive pace of the work; this is not ordinary farming machinery, therefore the drivers are given specialized training for driving the raking machines.

Révision du référentiel européen des Meilleures Techniques disponibles : contribution de la filière

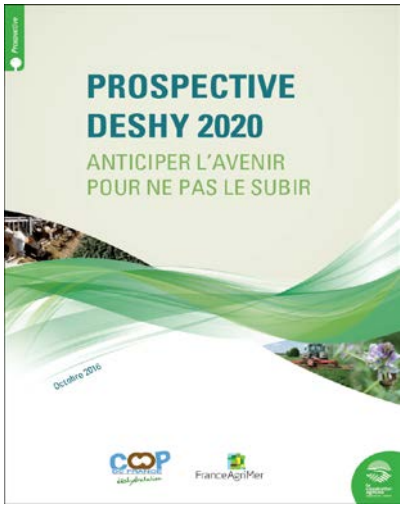


Enquête nationale de production de la filière : intégration des inventaires nationaux du CITEPA

- CET

L'AVENIR

- **DESHY 2020: anticiper l'avenir plutôt que le subir.**
  - Formidable travail collaboratif au sein de la filière
  - Les comités doivent maintenant mettre en œuvre les axes de développement définis.



- **Evolution de la PAC: une grande incertitude.**
- **Durcissement programmé de la réglementation européenne:**
  - future directive ETS
  - Plafonds technologiques en matière d'économies d'énergie.

LA COMMUNICATION

ACTIONS DE COMMUNICATIONS MENEES EN 2016 :

- Presse
- salons
- Conférences
- Evènements / relations publiques
- Edition
- Réseaux sociaux / web
- Goodies

CONCLUSION