

Agriculture and self-consumption: feedback from France

May 15, 2018

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OFATE
DFBEW

Summary



1/ Presentation of partners

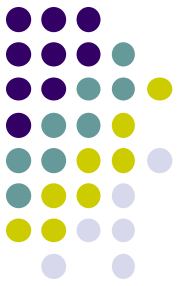
2/ State of the art of representative sectors in Brittany (pork, poultry, milk)

3/ Consumer profile analysis by sector

4/ Possible solutions

1/ Partners : ~~Belenn~~ APEPHA in agriculture

Farmers Producers of Electricity PHotovoltaic Associates



- 300 members in 34 departments
- Independent technical office specialized territories and photovoltaic power
- 31 MWp installed on more than 20 hectares of roof created in 2009
- 34 million kWh solar electricity produced in 2014
- 467,500 farmers / 4200 elected

Objectives: engineering, training, instrumentation / measurement, research and development.
Objectives: represent and serve photovoltaic electricity producers and project developers.

- Advising agricultural enterprises

Partners: Chambers of agriculture of Brittany, installers, banks, insurers, management centers
Missions: assistance with project management and procedures
Administrative procedures, technical and financial feasibility studies.
• Being a spokesperson for agriculture and privileged partner of public technical expertise, Tender Writing and specifications, site monitoring.

Examples of assignments:

- Training / information exchange
- Co-operating in engineering schools, universities: more than 300 hours per year
- Promoting PV on farm buildings, improve plant efficiency, experience feedback
- Creating added value in rural areas, Strengthening the PV sector

1/ Partnership Apepha / CA / Belenn Engineering



Works since 2012

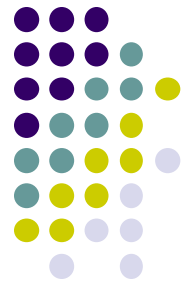
CA/BELENN

- Training for farmers (photovoltaic and wind farm)
- Set up of a buying group (1.5 Mwc in progress)
- Quality charter
- Photovoltaic study with a Smart Grid for dairy farm

APEPHA/BELENN

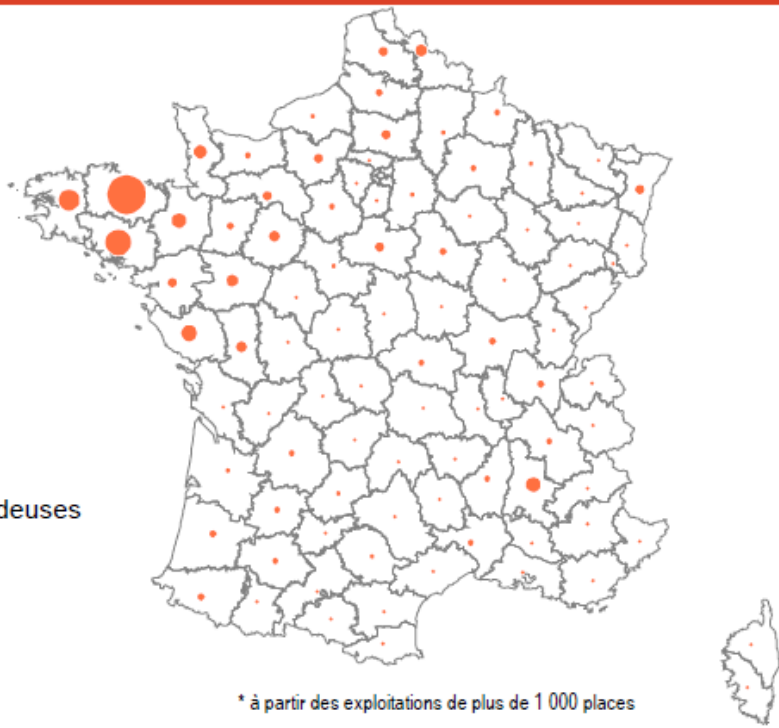
- Writing of scientific and technical documents: sizing rules and technical vigilance points, technological evolution of the components, state of the art storage technologies
- Audit and approval of regional installers
- Analysis of the best performing and worst performing generators
- Attendance at general meetings

22/ State of the art: poultry industry



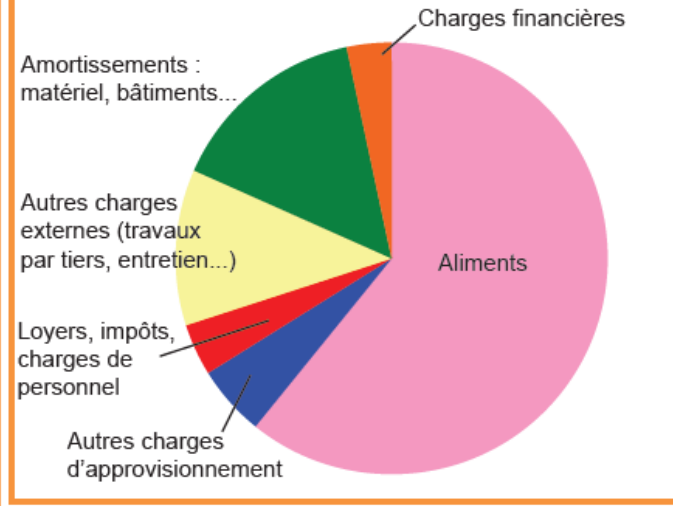
Effectif de porcs à l'engrais en 2016

Capacités d'élevage de poules en 2010



L'aliment : près des deux tiers des charges en 2015

Répartition des charges 2015 dans les exploitations de poules pondeuses en France métropolitaine



Source : Agreste, Draaf Bretagne, Rica

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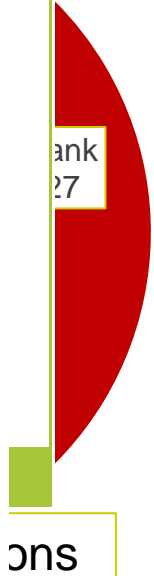
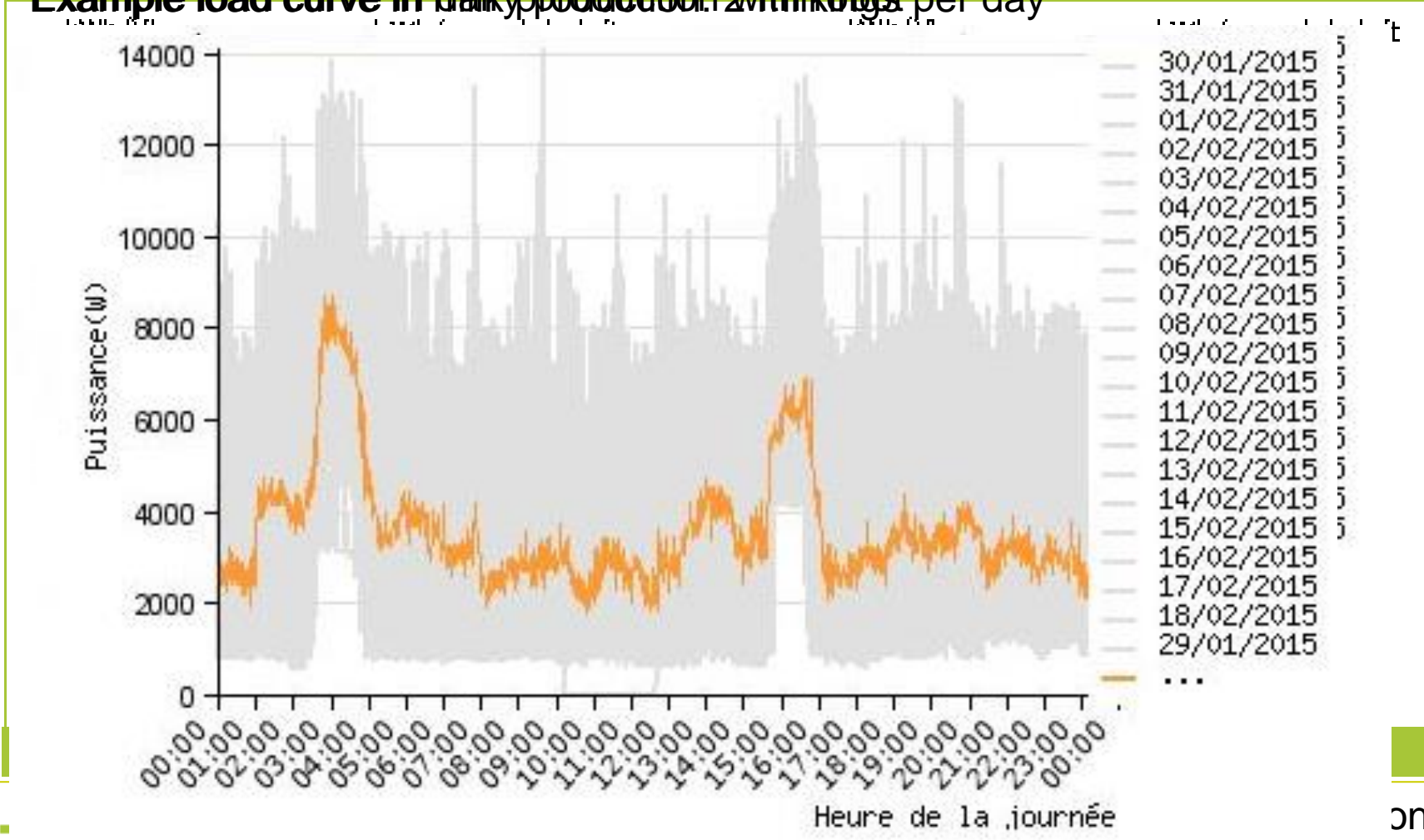
Source : Agreste, Draaf Bretagne, recensement agricole 2010

Source : Agreste, Draaf Bretagne, statistique agricole annuelle 2016 semi-définitive

3/ Consumption profile: milk production



Example load curve in dairy production with kilowatt per day



3 / Consumption profile: pork production



Example curve example in pig production with slurry treatment plant

Naisse
(en kW)



* Corre.
| Cesvc

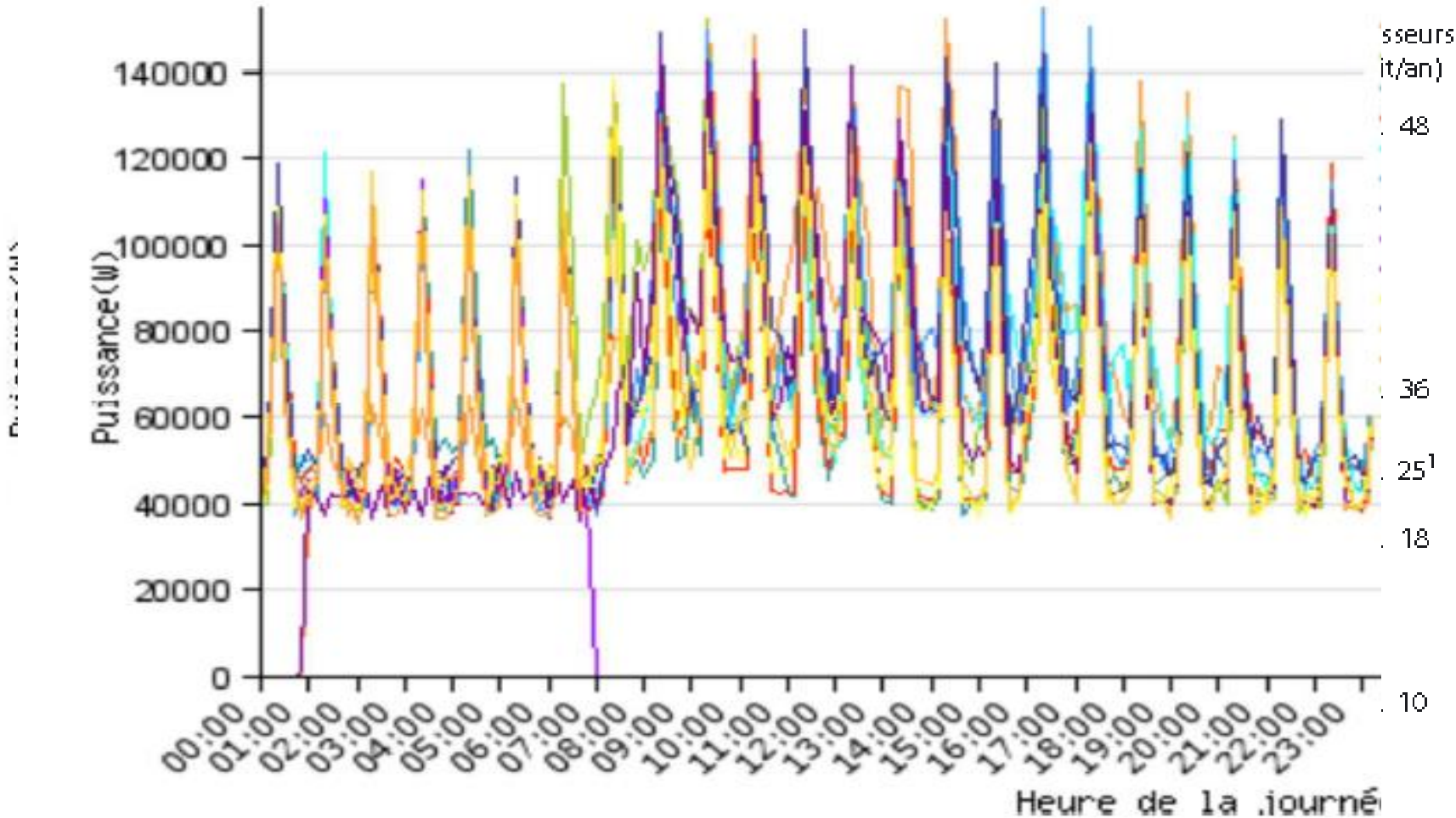
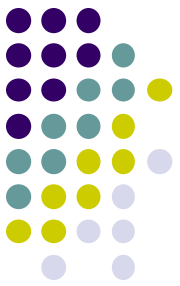


Figure 5 : Répartition des consommations énergétiques par stade physiologique

3 / Consumption profile: Poultry production



	Consommation moyenne annuelle (kWh/m ²)	25 % inférieurs (kWh/m ²)	25 % supérieurs (kWh/m ²)	Taille échantillon
Dinde standard	11,7	7,2	13,1	7
Poulet standard	15,2	9,4	20,3	14
ENSEMBLE	15,0			21

Consommations moyennes annuelles d'électricité.
(Source : Etude URE dans les bâtiments d'élevage, ADEME 2006)

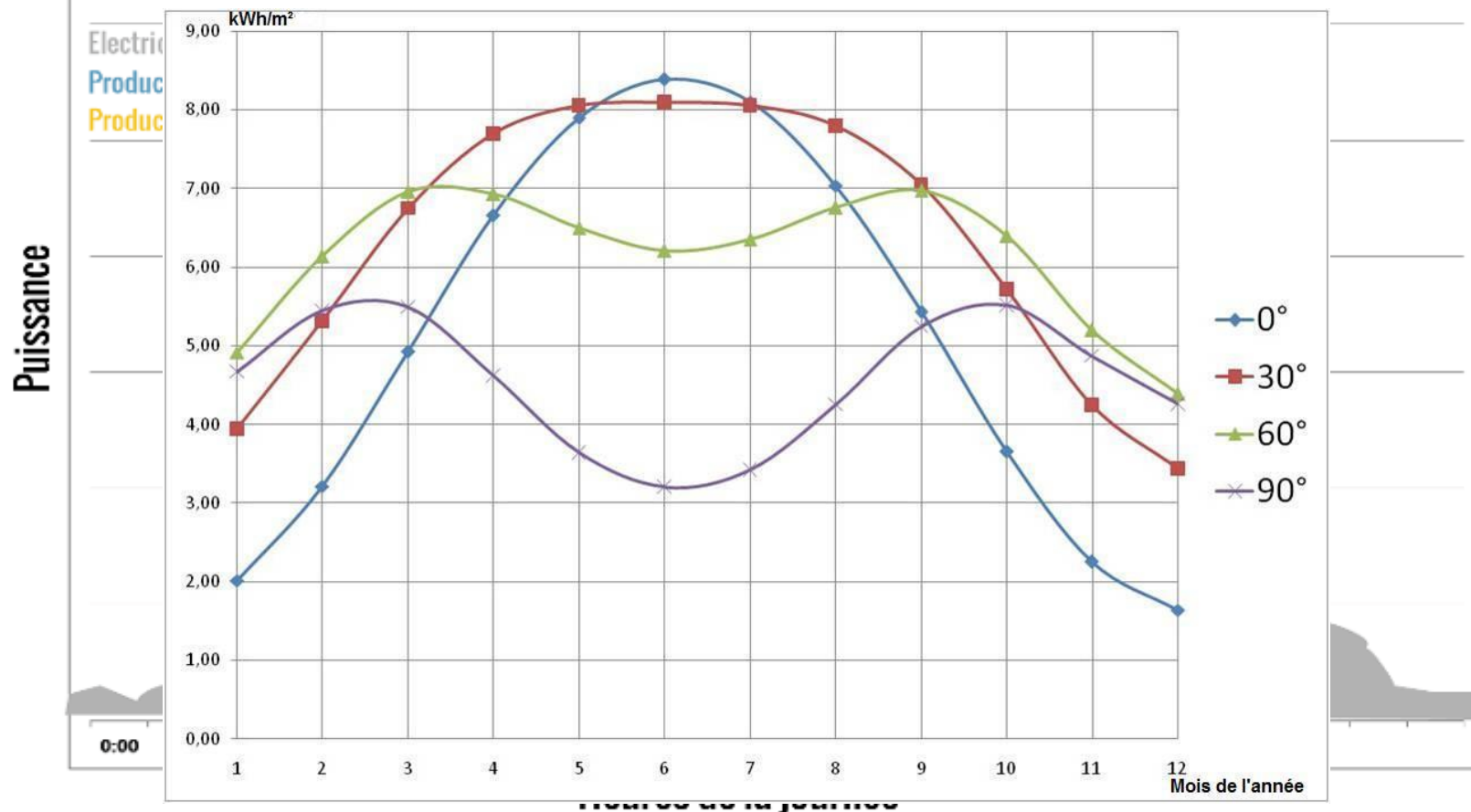
References on strict breeding

4 / Solutions: photovoltaïque et production consommation rate



Modify the inclination of the modules (distribution of production over the year) 30°, 45° et 60°

Photovoltaïque : autoconsommation sans stockage



Thank you for your attention...



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