CIRCULAR ECONOMY AND SUSTAINABILITY

ORDEM DOS ENGENHEIROS

OLIVE POMACE VALORIZATION
A PROBLEM SOLVED, NOT FULL OPTIMIZED

Casa Alta

JOÃO DIOGO
Casa Alta

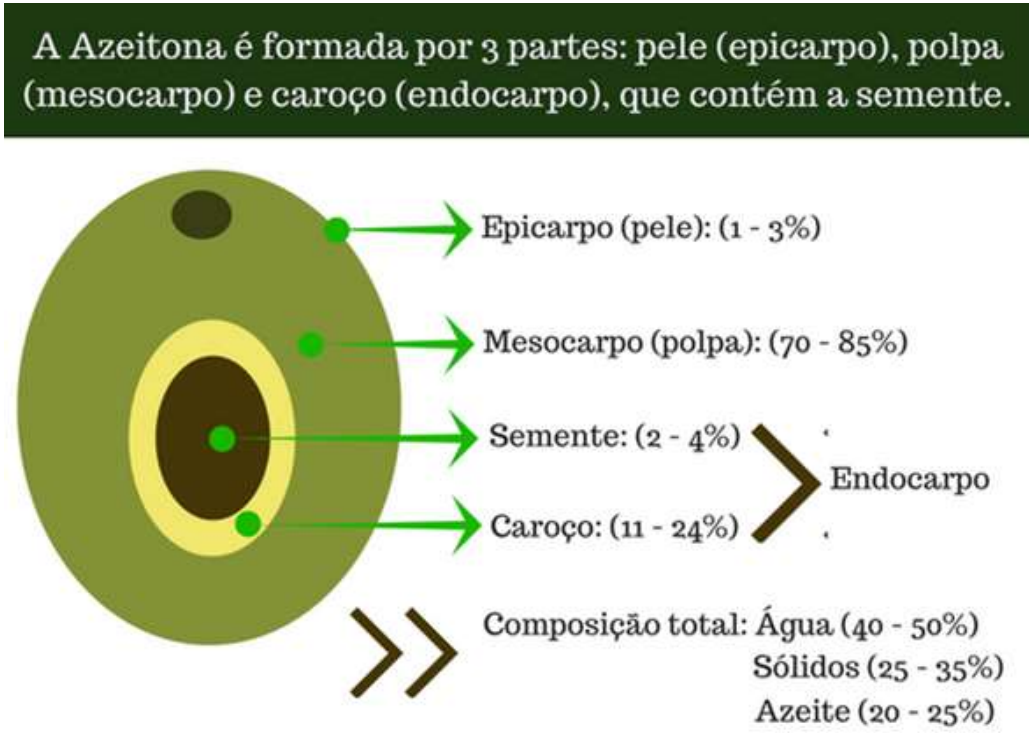
July 8th, 2021

Waste is all what economy is not capable to valorize!

Olive oil sector is capable today to valorize all the olive fractions.

Olive oil pomace sector does not treat waste.

The olive pomace problem is solved however improvements should be done.



Waste is all what economy is not capable to valorize!

Oil or Fat

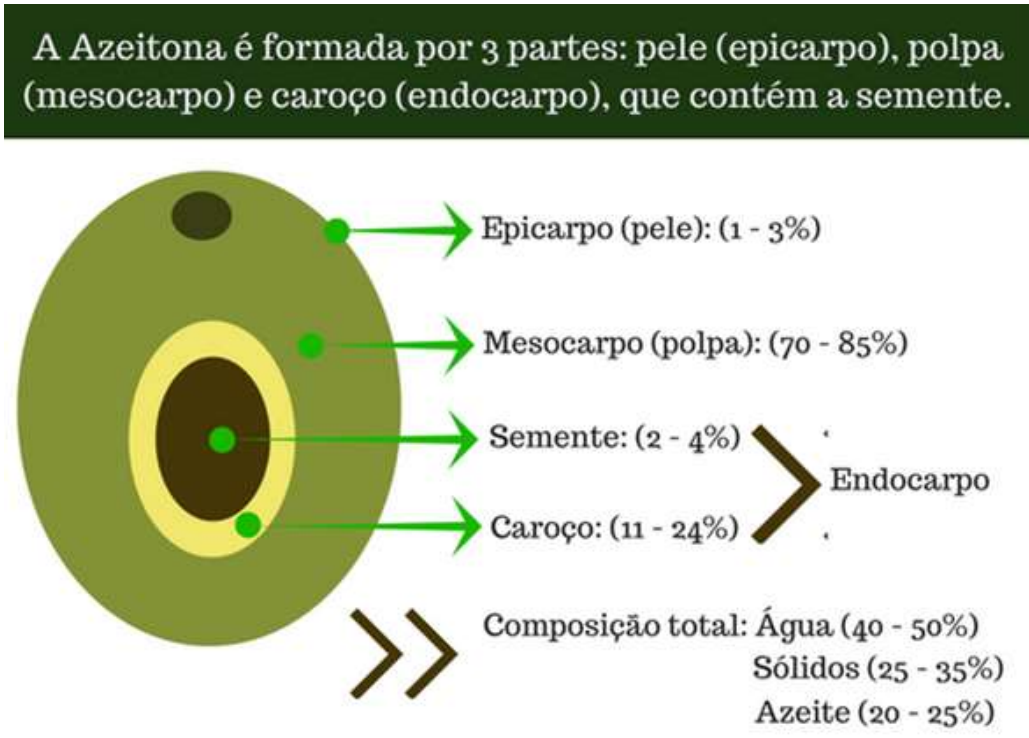
- **Extra virgin**
- **Virgin**
- **Refined**
- **Pomace**

SEPARATION OF ~98%

Pits

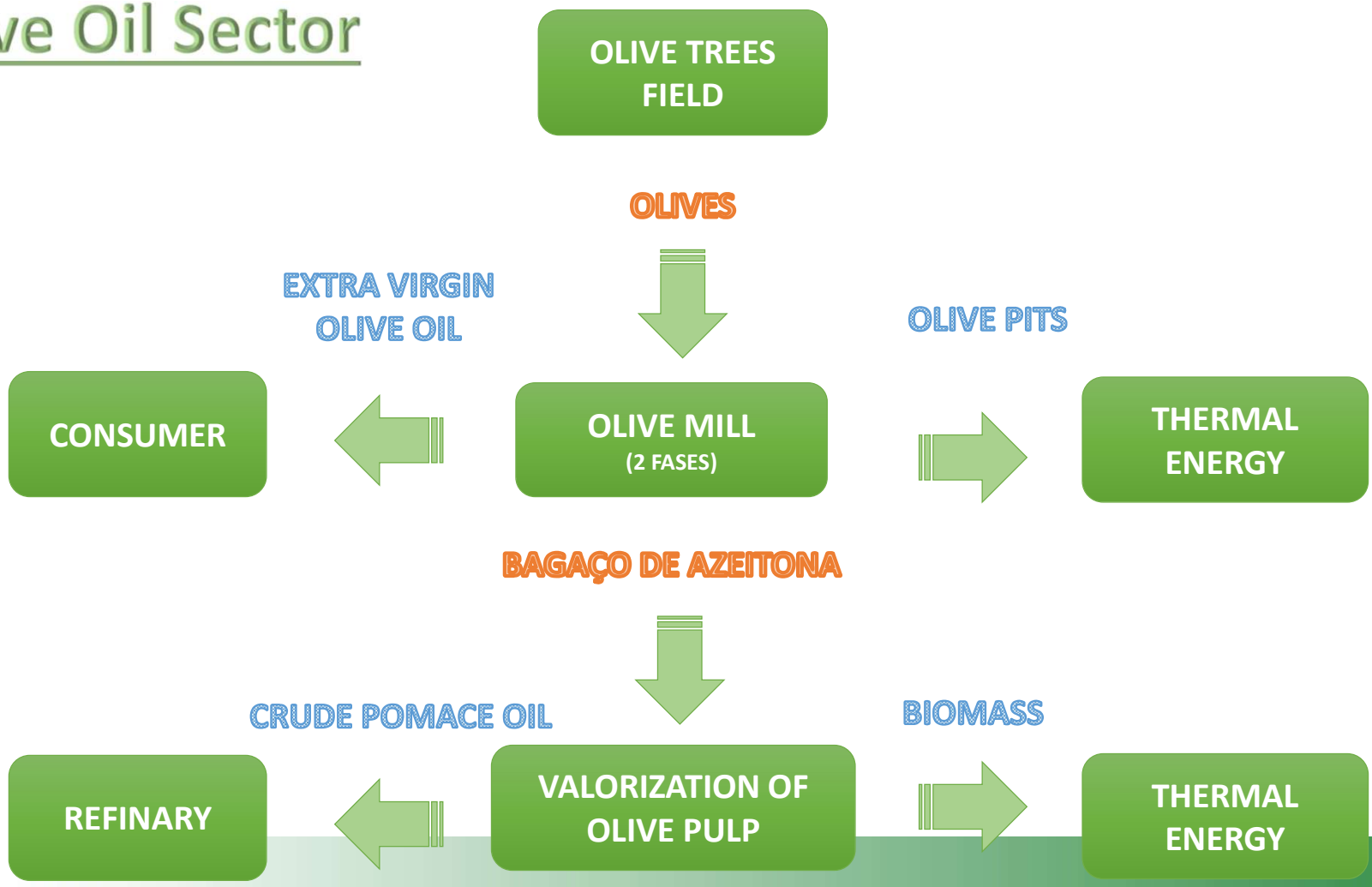
SEPARATION OF ~88%

Dry pulp or Biomass



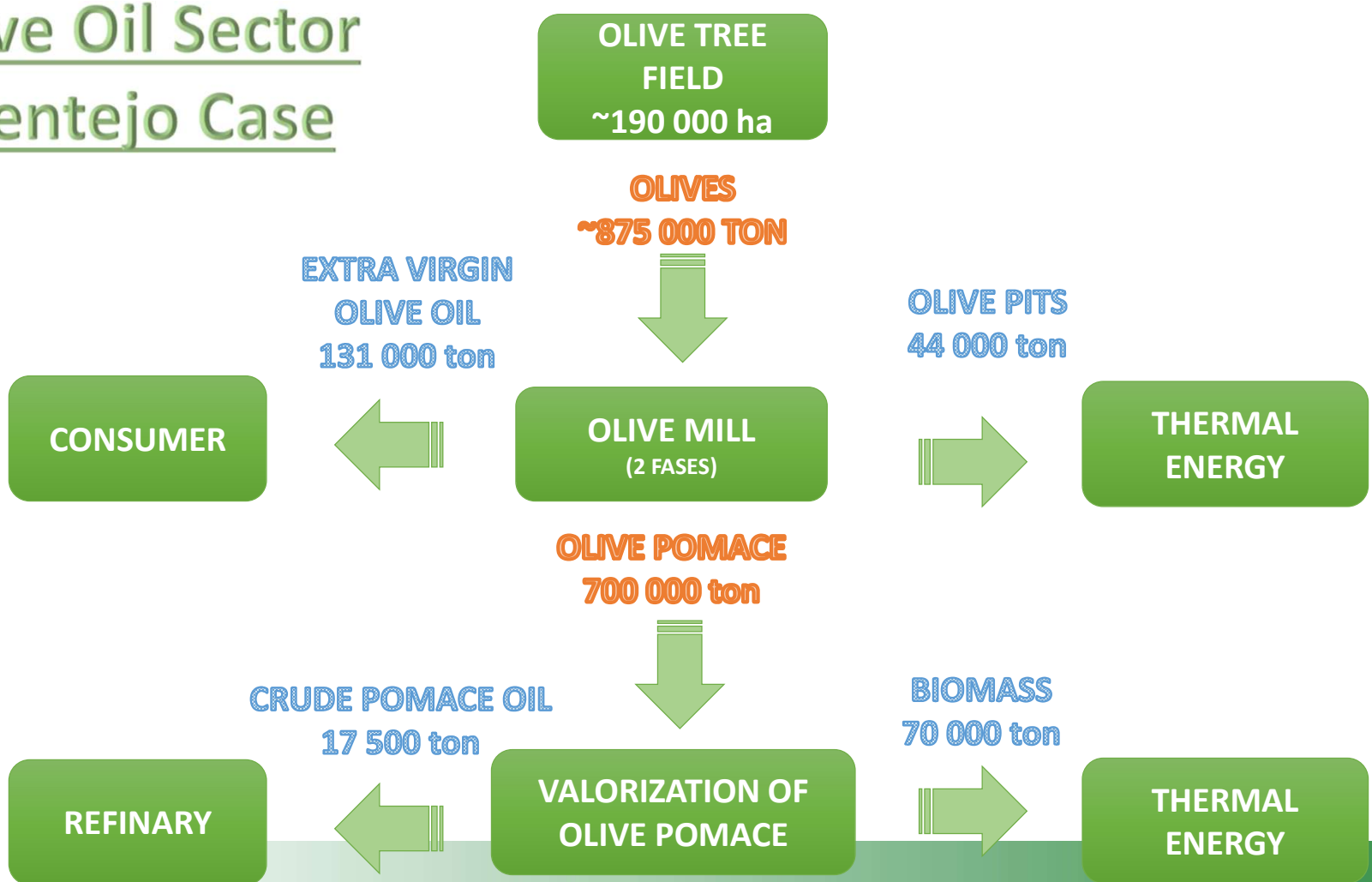
OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

Olive Oil Sector



OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

Olive Oil Sector
Alentejo Case



OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

OLIVE MILL

EV OLIVE OIL

OLIVE PITS

CONSUMER

THERMAL ENERGY

REFINARY

CRUDE POMACE OIL

OLIVE TREE

OLIVES

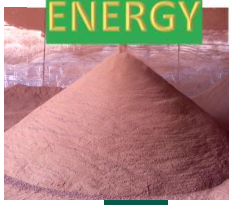
OLIVE POMACE

OLIVE POMACE VALORIZATION

OILVE PITS

THERMAL ENERGY

BIOMASS



CARBON CICLE

CO_2

CO_2 FROM OTHER SOURCERS

OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

WATER CONSUMPTION: 3 000 M³/Ha/YEAR

OLIVE TREE FIELD

OLIVES

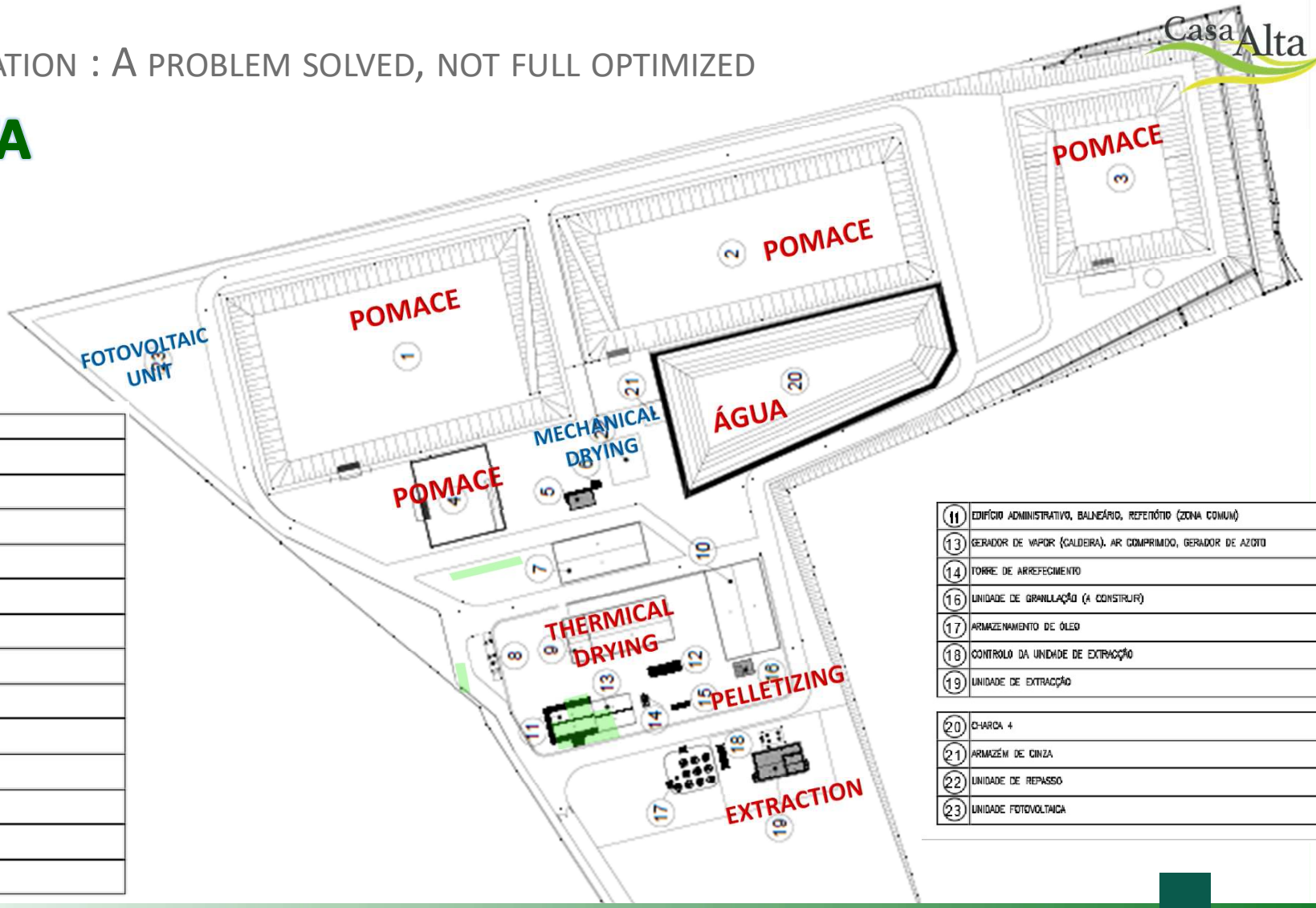
OLIVE POMACE

OLIVE POMACE VALORIZATION

WATER CONSUMPTION: 1.5 M³/Ha

OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

CASA ALTA



Position	
1	CHARCA 1
2	CHARCA 2
3	CHARCA 3
4	CHARCA PULMÃO
5	UNIDADE DE DESCAROÇAGEM
6	CONTROLO DA UNIDADE DESCAROÇAGEM E TRANSPORTE
7	ARMAZÉM DE BIOMASSA
8	BALANÇA
9	UNIDADE DE SECAGEM
10	ARMAZÉM DE BAGAÇO SECO OLEOSO
11	EDIFICIO ADMINISTRATIVO, BALNEÁRIO, REFEITÓTIO (ZONA COMUM)
12	SALA DE CONTROLO DA UNIDADE DE SECAGEM
15	PPOSTO DE TRANSFORMAÇÃO, QUADRO DE GERAL DE BAIXA TENSÃO

11	EDIFÍCIO ADMINISTRATIVO, BALNEÁRIO, REFEITÓTIO (ZONA COMUM)
13	GERADOR DE VAPOR (CALDEIRA), AR COMPRIMIDO, GERADOR DE AZOTO
14	TORRE DE ARREFECIMENTO
16	UNIDADE DE GRANULAÇÃO (A CONSTRUIR)
17	ARMAZENAMENTO DE ÓLEO
18	CONTROLO DA UNIDADE DE EXTRACÇÃO
19	UNIDADE DE EXTRACÇÃO

20	CHARCA 4
21	ARMAZÉM DE CINZA
22	UNIDADE DE REPASSO
23	UNIDADE FOTOVOLTAICA

POMACE POOLS

POMACE STORAGE

3 meses de Collection
6-10 Months of Operation

WATER STORAGE AND WATER EVAPORATION

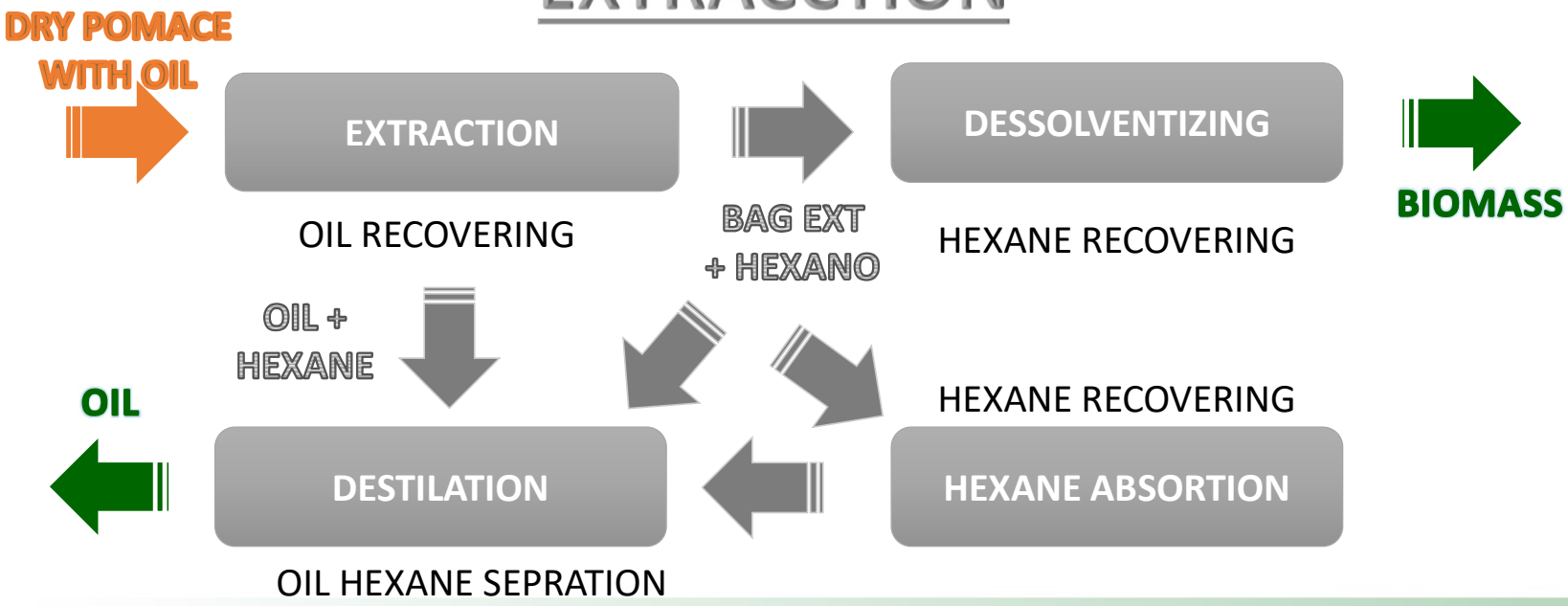
3 DRYERS

Drying capacity: 45 ton/h
Dryers: 3x30 m
Combustion chambers: 8 e 14 Mw

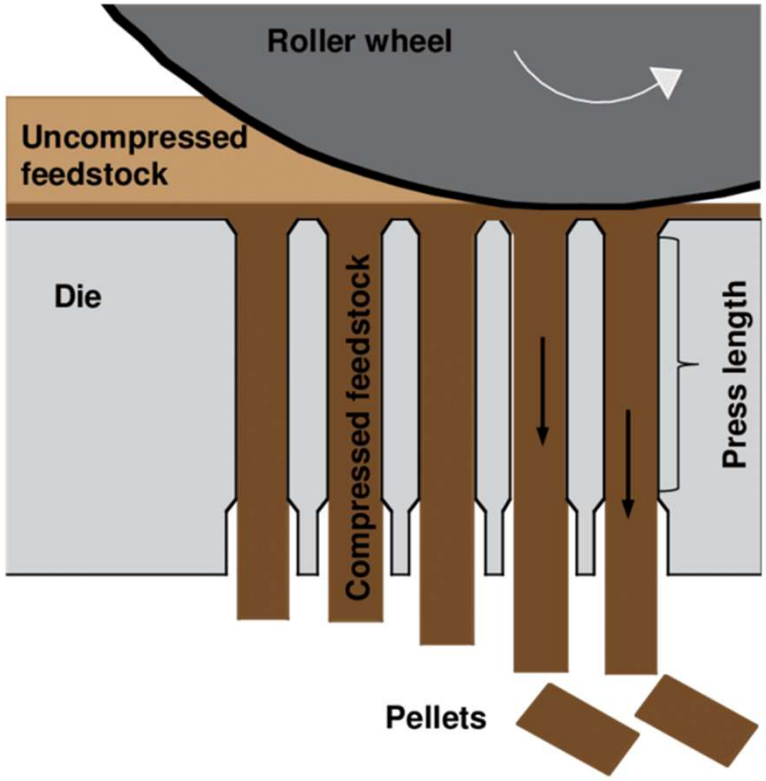
In moister: **[72-74]% H2O**
Out moister: **8 % H2O**

OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

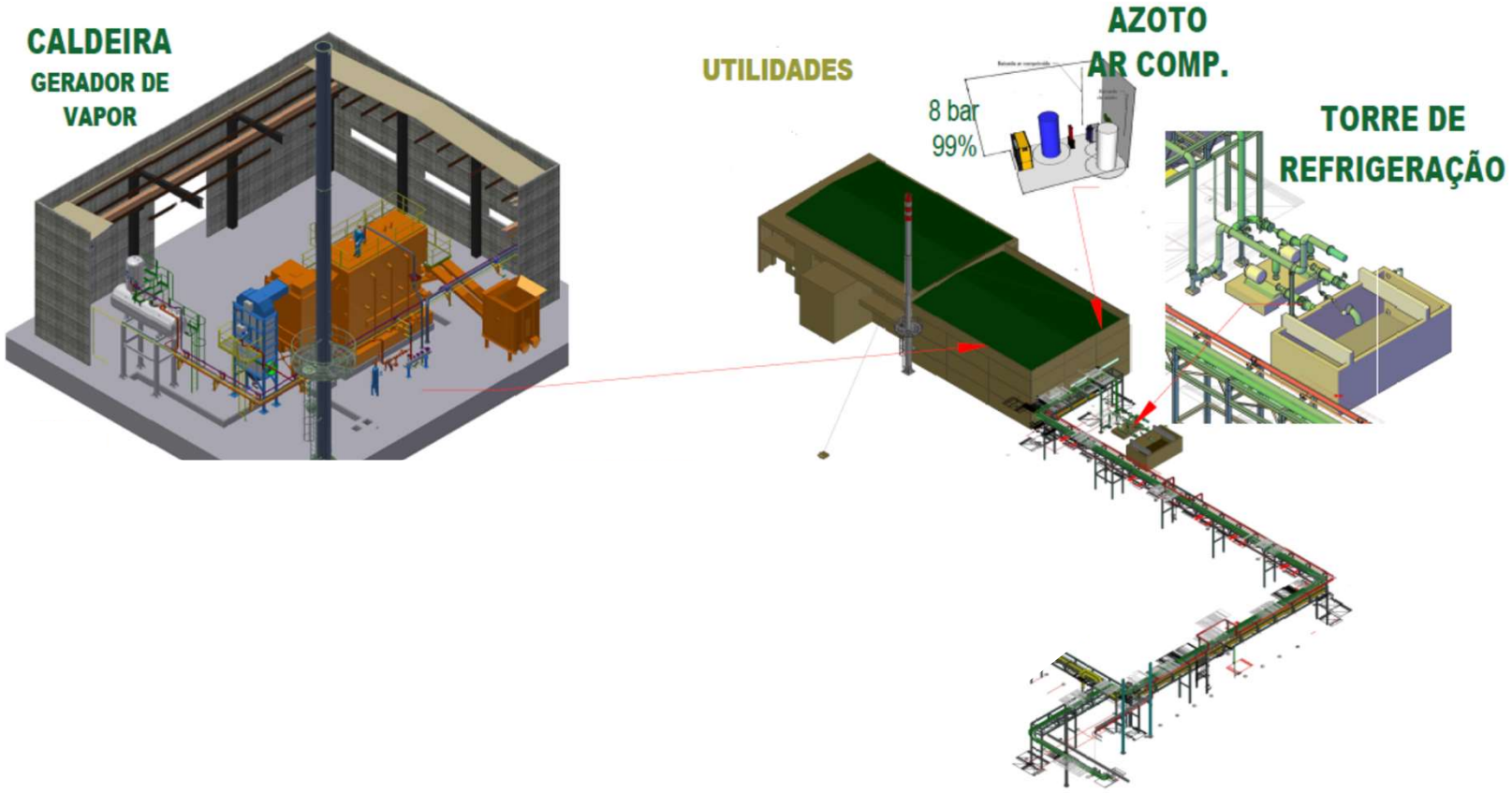
EXTRACCTION



PELLETIZING



OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED



OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

POMACE STORAGE

PITS SEPARATION UNIT

DRYING UNIT

PELLETING UNIT

OLIVE POMACE

HIGH MOISTER CONTENT

DRY

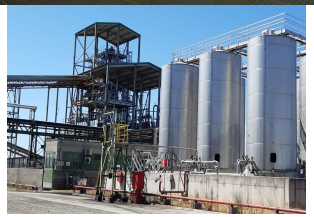
OIIVE PITS

PELLETIZED

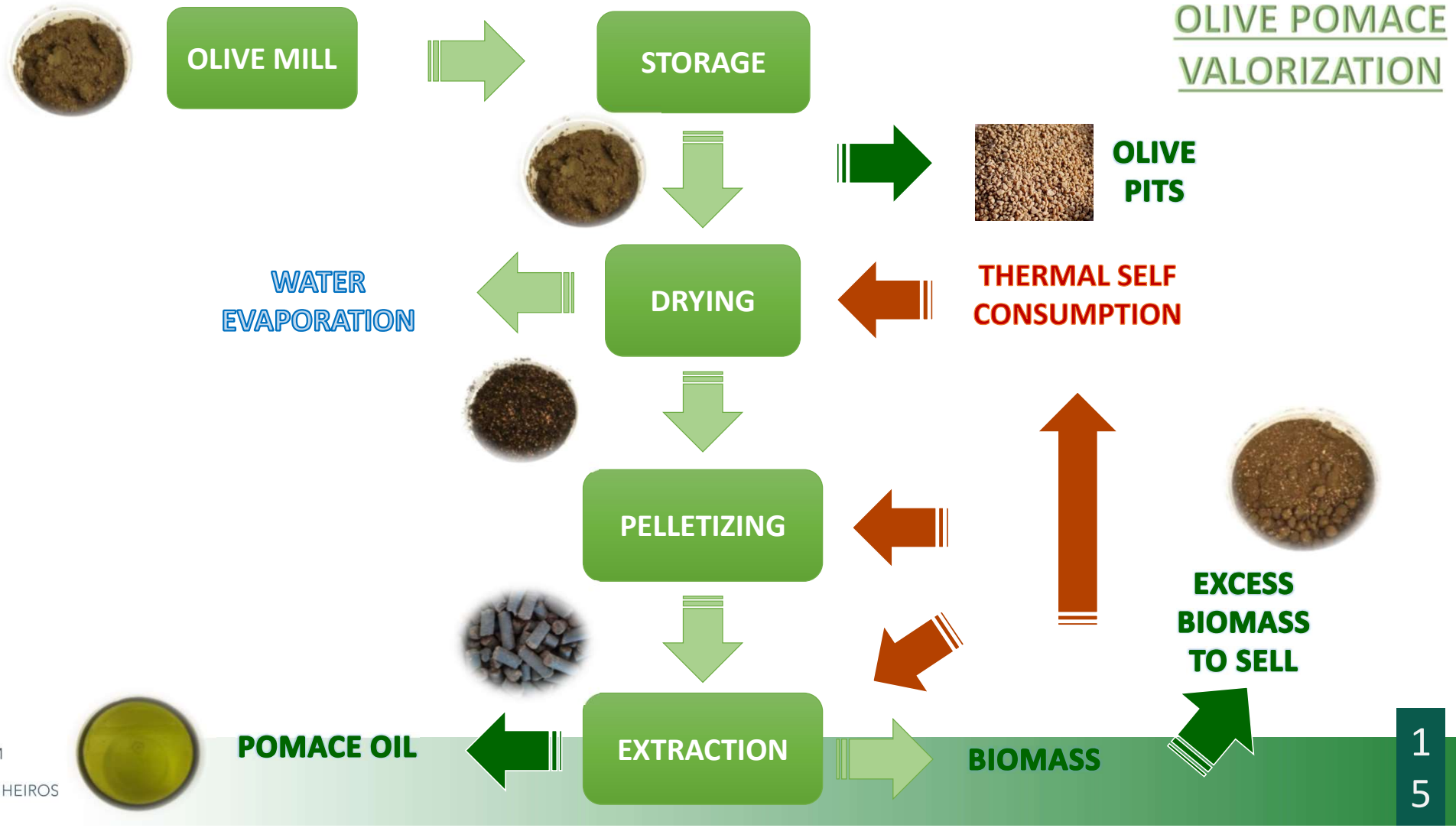
BIOMASS

CRUDE OIL

EXTRACTION UNIT



OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

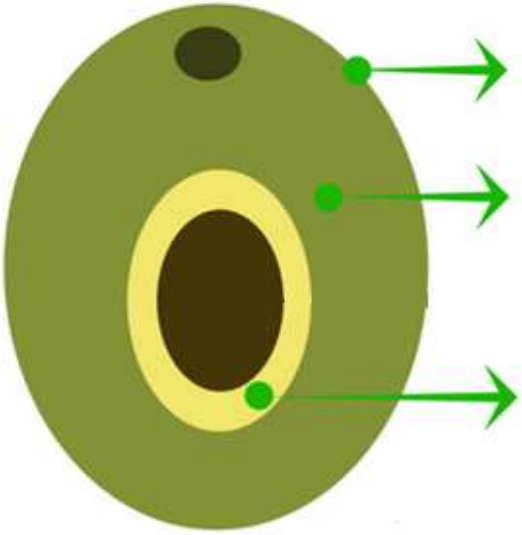


OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

OLIVE OIL SECTOR MEANS:

- CIRCULAR ECONOMY
- ECONOMICAL AND ENVIRONMENTAL SUSTABILITY
- ENERGY EFICIENCY EFICIENCIA ENERGETICA

OLIVE TREES ARE EXTREMELY GENEROUS,
THEY CAN GIVE A LOT WITH ONLY A FEW RESORCES



EXTRA VIRGEN OLIVE OIL OIL POMACE	HIGH QUALITY AND HEALTHY VEGETABLE OILS
HYDROXITYROSOL, TYROSOL, TOCOPHEROL …	HIGH POWERFUL AND HEALTHY ANTIOXIDANTS
OLIVE PITS EXTRACTED POMACE BIOMASS	BIOGENIC AND HIGH CALORIC COMBUSTIUBLES

OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

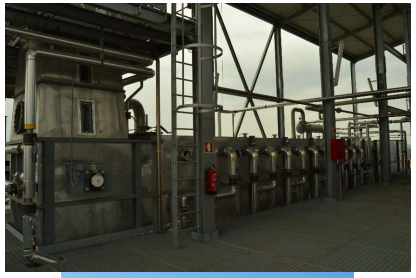
POMACE POOL STORAGE

PITS SEPARATION UNIT

DRYING UNIT

PELLETING UNIT

EXTRACTION UNIT



CHALLENGES OF IMPROVEMENT:

FULL AUTOMATIC PLANT:

- FROM POOL STORAGE TO BIOMASS STORAGE;
- WATER TREATMENT;
- STEAM GENERATOR;
- COMPRESSED AIR AND NITROGEN GENERATORS;
- 24 HOUR DATA AQUISITOIN REPORTED BY GRAFIC TO ASSIST PRODUTION AND ENGINEERING;

OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

Casa Alta

CHALLENGES OF IMPROVEMENT:

- REDUCE WATER AND BIOMASS COMSUNTION
- OLIVE WATER PROCESSING
- BIOMASS ASHES PROCESSING

WATER CONSUMPTION: 3 000 M³/Ha/YEAR

OLIVE TREE FIELD

OLIVES

OLIVE MILL

OLIVE POMACE

OLIVE POMACE VALORIZATION

WATER CONSUMPTION: 1.5 M³/Ha

OLIVE POMACE VALORIZATION : A PROBLEM SOLVED, NOT FULL OPTIMIZED

Casa Alta

CHALLENGES OF IMPROVEMENT:

- REDUCE WATER AND BIOMASS COMSUNTION
- OLIVE WATER PROCESSING
- BIOMASS ASHES PROCESSING

WATER CONSUMPTION: 3 000 M^3/Ha/YEAR

OLIVE TREE FIELD

OLIVES

OLIVE POMACE

OLIVE POMACE VALORIZATION

REDUCE WATER CONSUMPTION IN 80%

VALORIZATION OF OLIVE WATER; VALORIZATION OF ASHES

CARBON AND MINERAL CICLE

CHALLENGES OF IMPROVEMENT: BY PRODUCTS FOR THE FUTURE

OLIVE WATER:

- **PHARMACEUTICALS;**
- **NUTRACEUTICALS;**
- **FERTILIZERS;**

BIOMASS ASSHES:

- **BIOFERTILIZERS;**

BIOMASS:

- **FERTILIZERS;**
- **ANIMAL FUNCTIONAL FOOD;**

Casa Alta

THANK YOU

ORDEM DOS ENGENHEIROS