

Aquaculture in Portugal



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LABORATÓRIO ASSOCIADO

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EAS 2010 Students Workshop, 6th October, Porto, Portugal



Historical Overview

- **1898** – First rainbow trout aquaculture facility
- **End of the 19th century** – Tejo oyster production major increase
- **1930's** – The Portuguese oyster exports reach 13000 Ton/year
- **1968** – Aquaculture is organized as a commercial activity
- **1970's** – Rainbow trout reaches a regular production

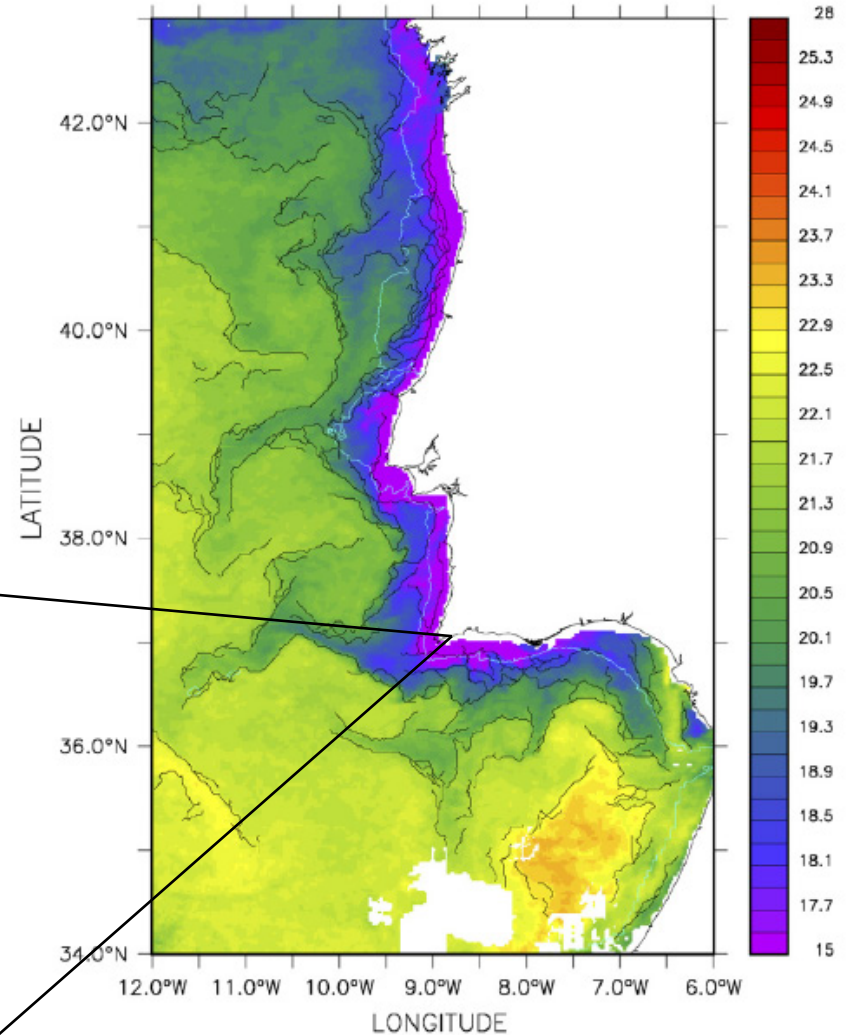
Historical Overview (cont.)

- **1980s** – Aquaculture is based on bivalve and trout production
- **1986** – Portugal enters the EEC/EU
- **1990-2008:**
 - Freshwater production decreases
 - New seawater species through technological development:
 - Seabream
 - Seabass
 - Turbot

Aquaculture Geo-Potential



- 8 River Estuaries and 3 Rias
- Large coastal areas
- Suitable temperature range
- Productive waters

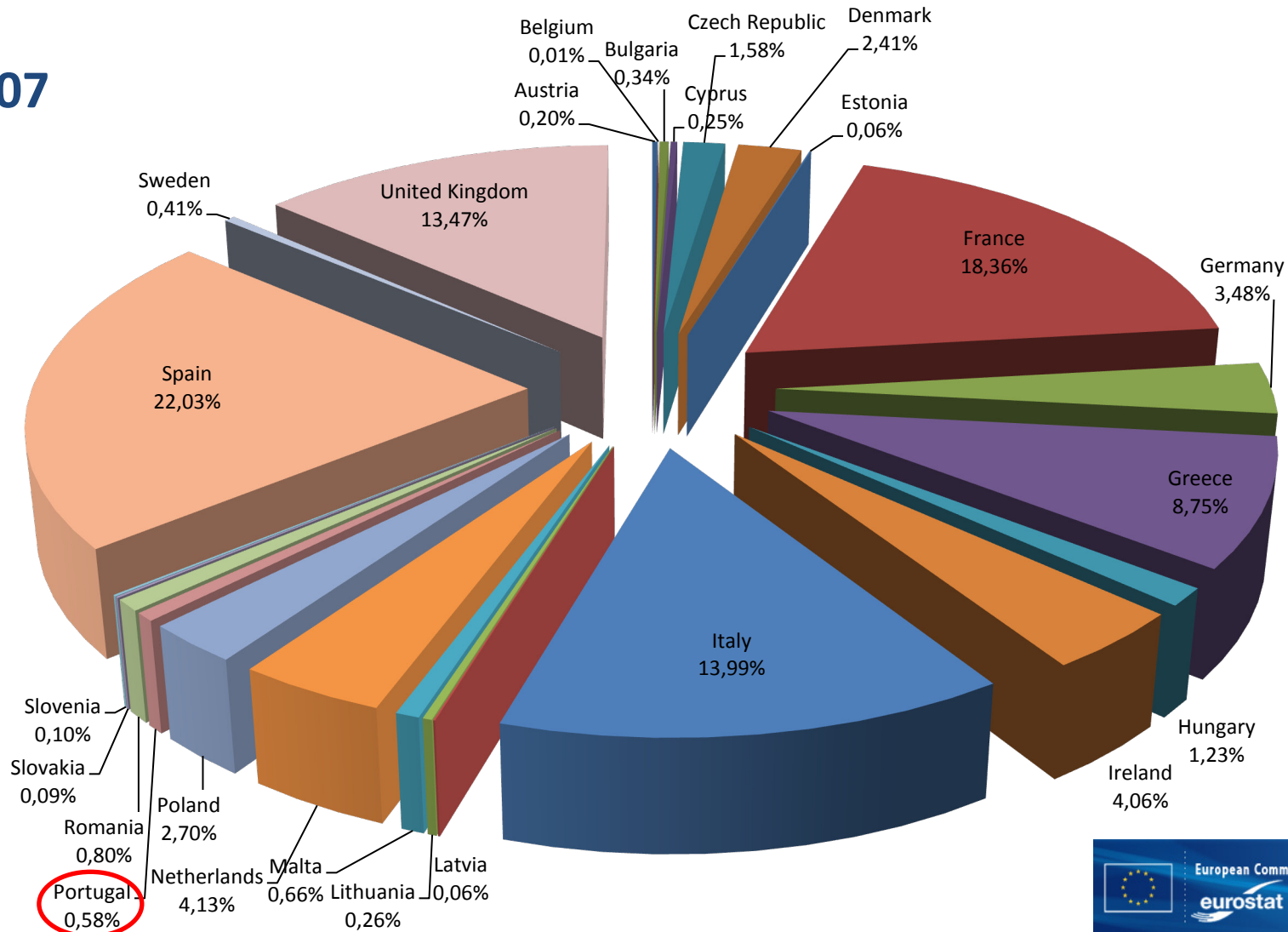


SST (°C) – 29–JUL–2003

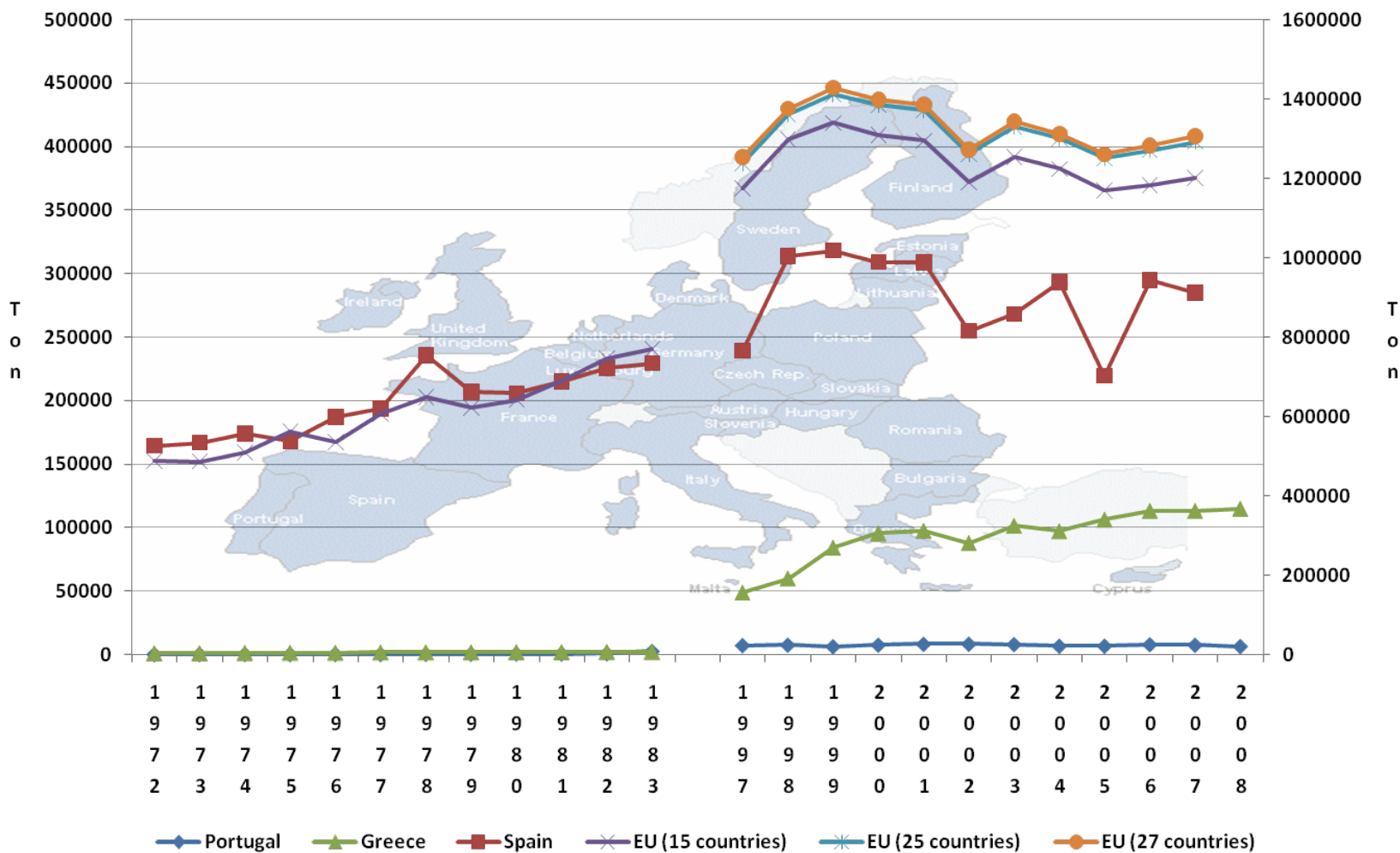
Relvas et al. 2007

Portugal in the EU27 – Production

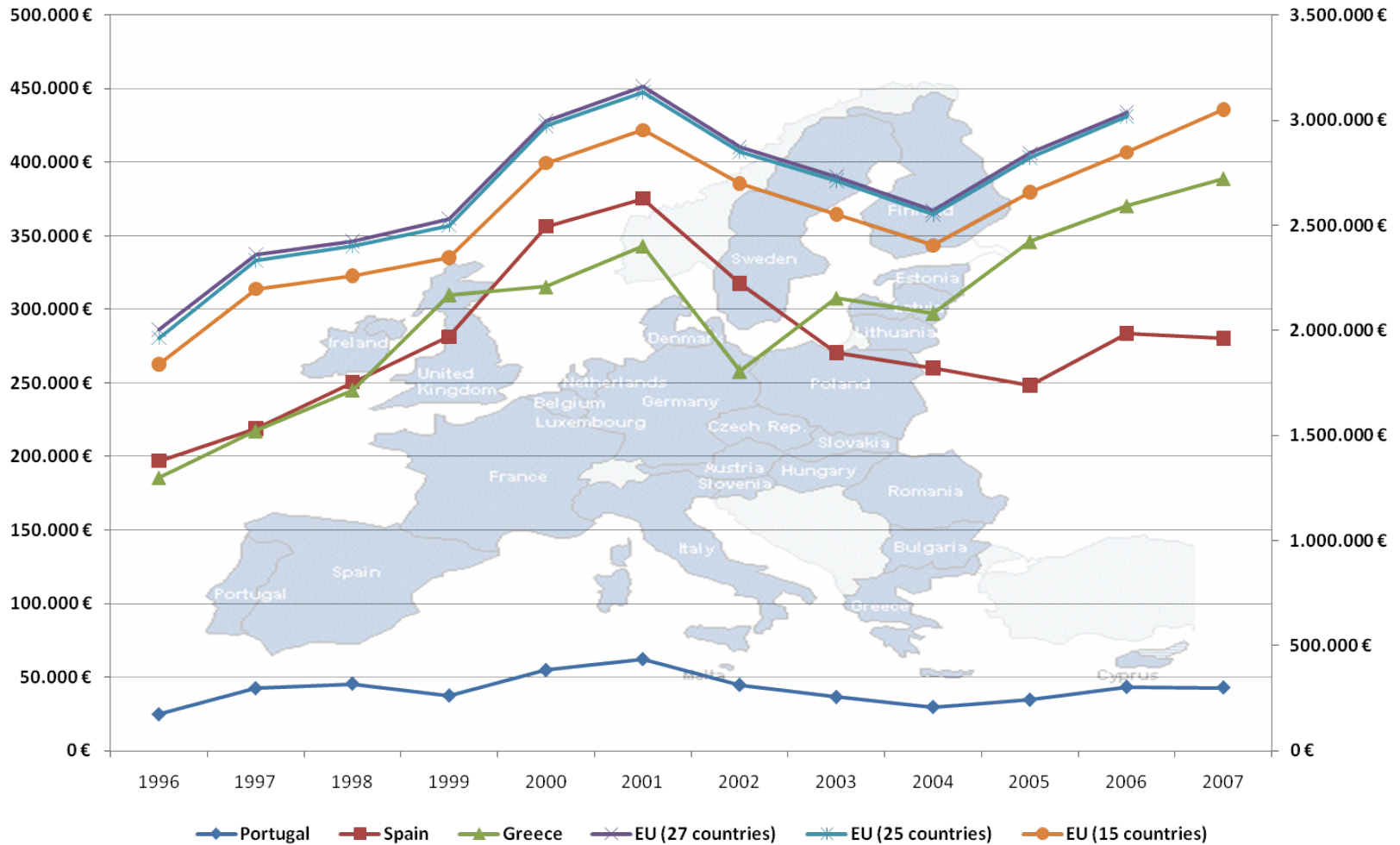
2007



Portugal in the EU – Production (cont.)



Portugal in the EU – Value



Aquaculture Companies



2008	Licenced		Operating		% L/O	
Type of Establishment	<i>n</i>	<i>Ha</i>	<i>n</i>	<i>Ha</i>	<i>n</i>	<i>Ha</i>
Hatchery	20	18	6	6	30.0	33.3
Grow out	1532	1926	1466	1571	95.7	81.6
Type of Production						
Extensive	1409	819	1384	709	98.2	86.6
Semi-Intensive	83	867	62	644	74.7	74.3
Intensive	60	258	26	224	43.3	86.8

- Latest information points to a decrease of the number of establishments of fish production
- Low number of hatcheries limits growth of grow out companies of either fish or mollusks

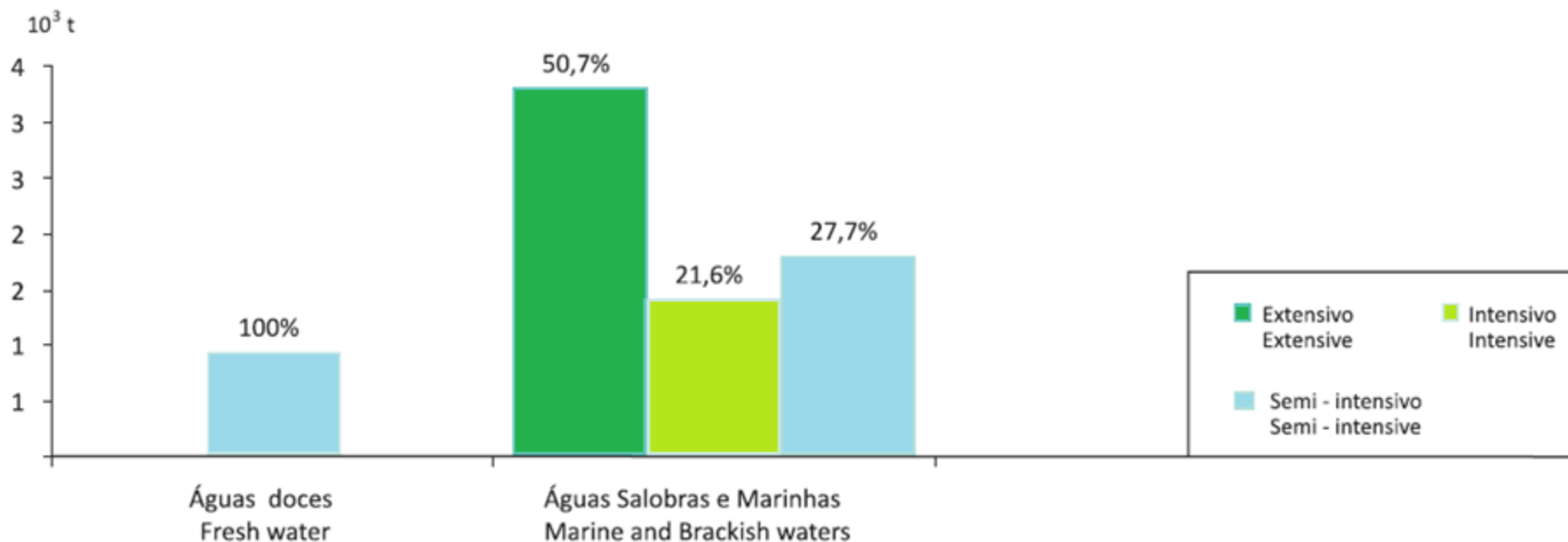


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Rural e das Pescas

DGPA
Direcção-Geral
das Pescas e Aquicultura

Aquaculture Companies (cont.)

Production by type of water and production system



INSTITUTO NACIONAL DE ESTATÍSTICA
STATISTICS PORTUGAL

75 Years
1935-2010



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Aquaculture Value



2008 Sales	Total		National		Exports	
	Ton	K€	Ton	K€	Ton	K€
Freshwater	725	1720	725	1720	0	0
Marine and Brackish waters	6160	39268	5580	36676	579	5592

- Portuguese Aquaculture products achieve a mean price of 6.37€/Kg
- Exports are only ~14% of total production



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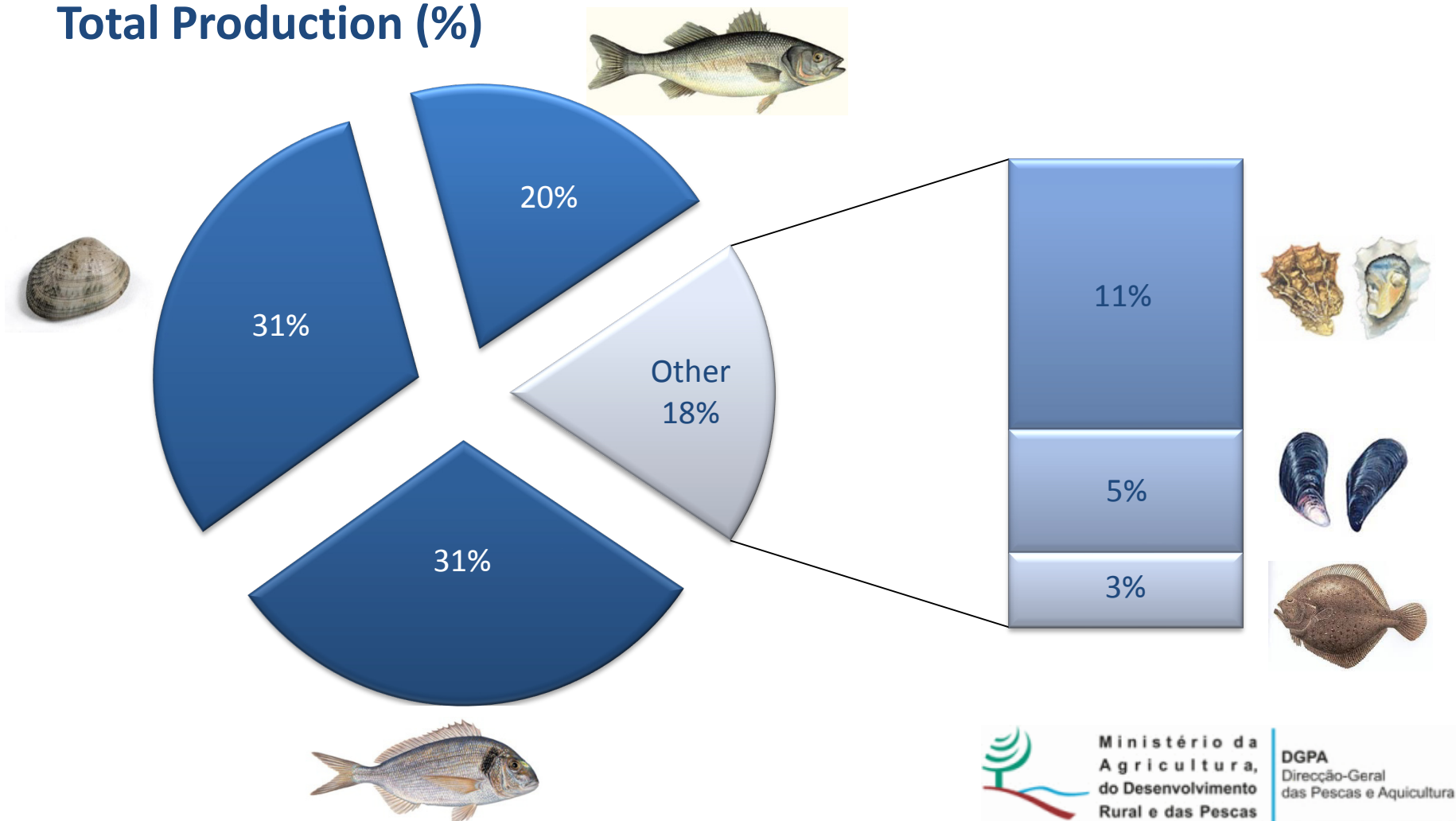
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Aquacultured Species - 2008



Total Production (%)

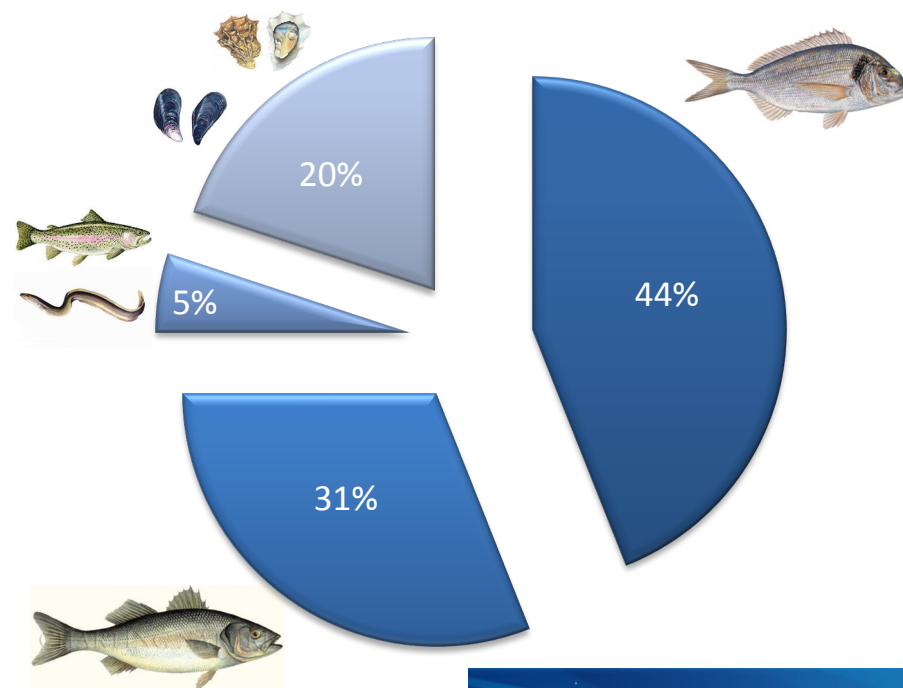
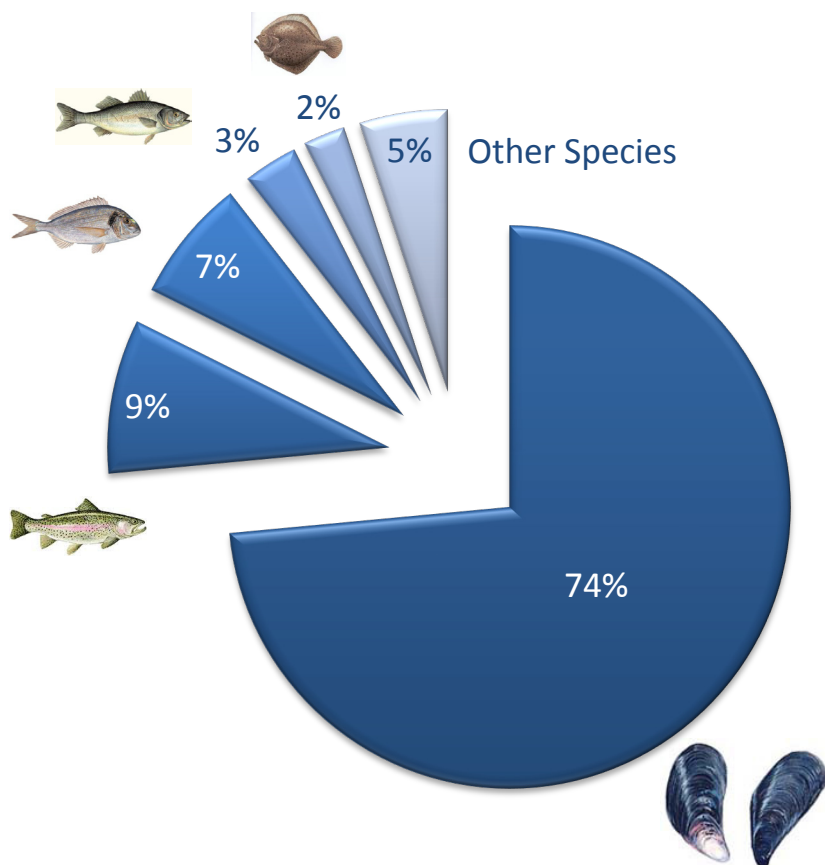


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Comparison with other EU Countries



Portugal in the EU – Resume

➤ 2007 Production

- EU 27 - ~1.3MTon/~3000M€
- PT – 7.5Ton – 15th Country/ ~41M€

➤ Most of the Production is based on marine species (~88%)

➤ 6% of Portugal GDP comes from Fisheries

➤ Aquaculture is only 2.9% of Portugal Fisheries (EU – 20%)

➤ National Consumption on fishery products:

- EU 27 – 21.4Kg/person/year
- PT – 56.9Kg/person/year

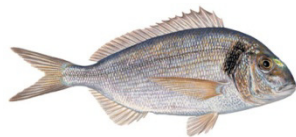
Species and Production



Extensive



Species and Production



Extensive + Semi-Intensive + Intensive

AQUAMAR



Aquamarim, Lda. (Algarve, Portugal)



AQUALVOR



SAPALSADO



PESCANOVA



World's Largest Turbot Production Facilities - ACUINOVA



Current Problems

- **Bureaucracy** – it takes at the least 3 years from the idea to implementation;
- **Implementation problems** on in- and on-shore production facilities due to **ambient policies** and **competition with tourism**;
- **Low investment** – both investors and national banks consider the activity as too risky;

Current Problems

- **Lack of or inadequate legislation** for some activities;
- **Low market prices** for the produced species;
- **Non-cooperative behavior** of the companies – too many associations/co-operatives (a total of 8);
- **Lack of scale** to impose both products and prices;
- **Lack of entrepreneurship** by the young.

Key aspects for development

➤ **Research** - Species Diversification and Integrated Systems



➤ **Updated technologies of production** – new and organic



➤ **Better understanding of the activity by the Government**



○ Less Bureaucracy – faster licensing and implementation

➤ **A unique Association/Co-operative**

○ Scale-up of the activity and management



○ Higher Education Trained Human Resources

Key aspects for development (cont.)

➤ Production

○ Bivalve Hatchery



○ Increased Number of Fish Hatcheries



➤ Brand and Marketing



➤ Seafood Safety and Quality

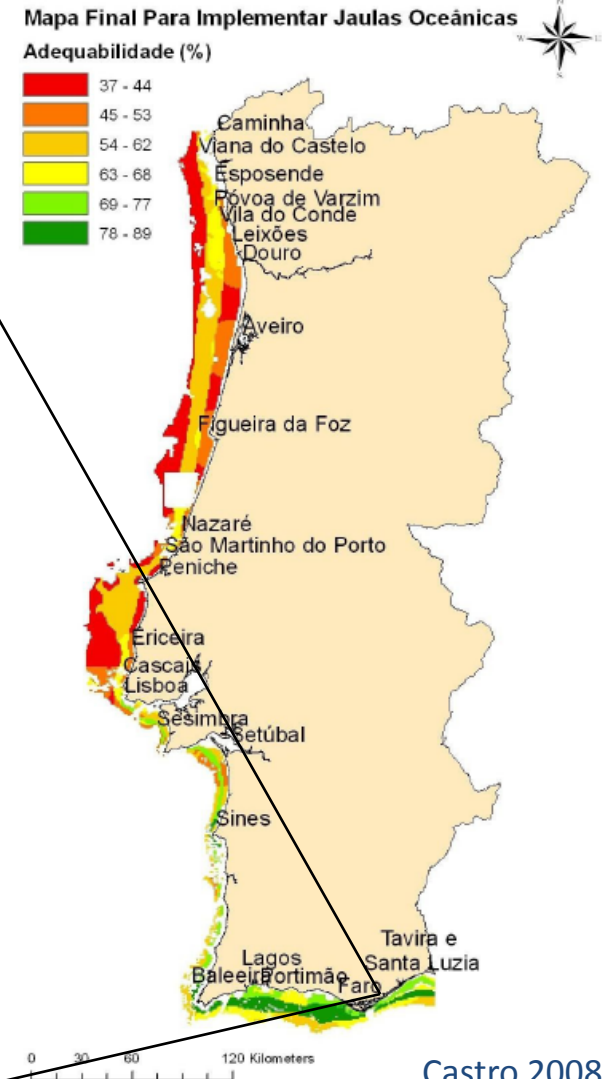
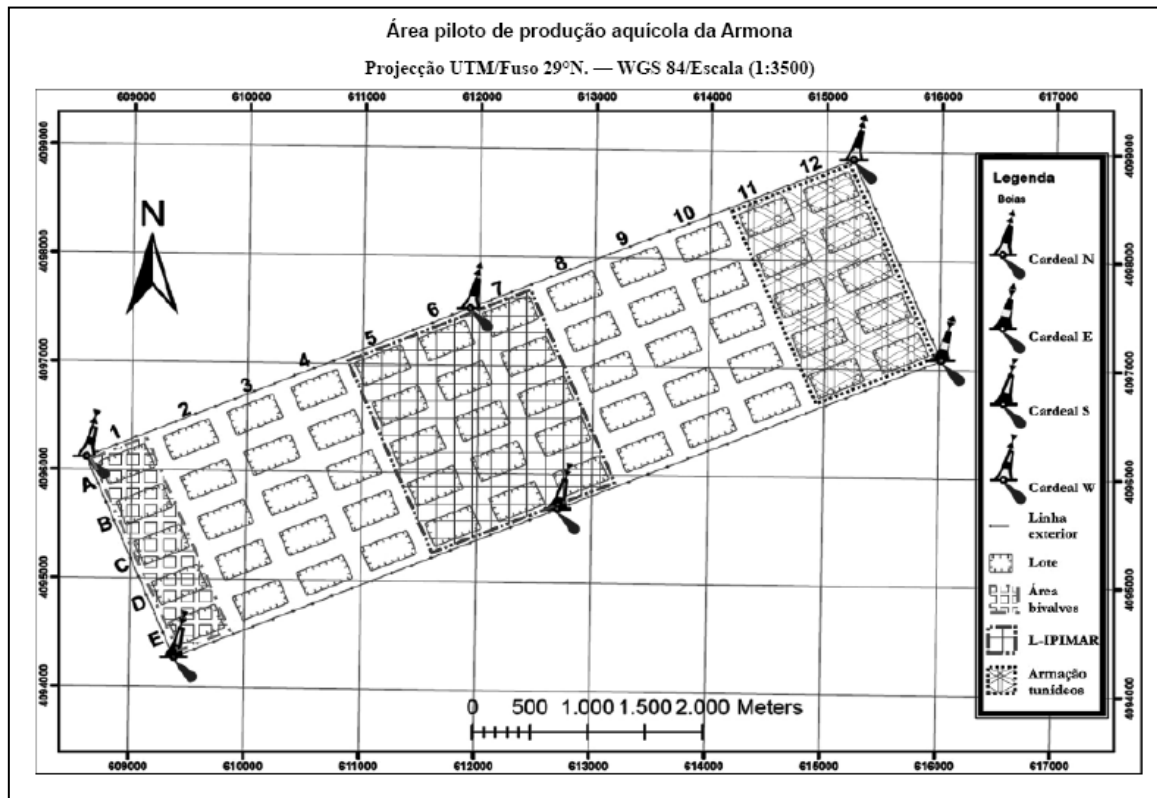
➤ Interaction with other activities –

Ambient and Tourism



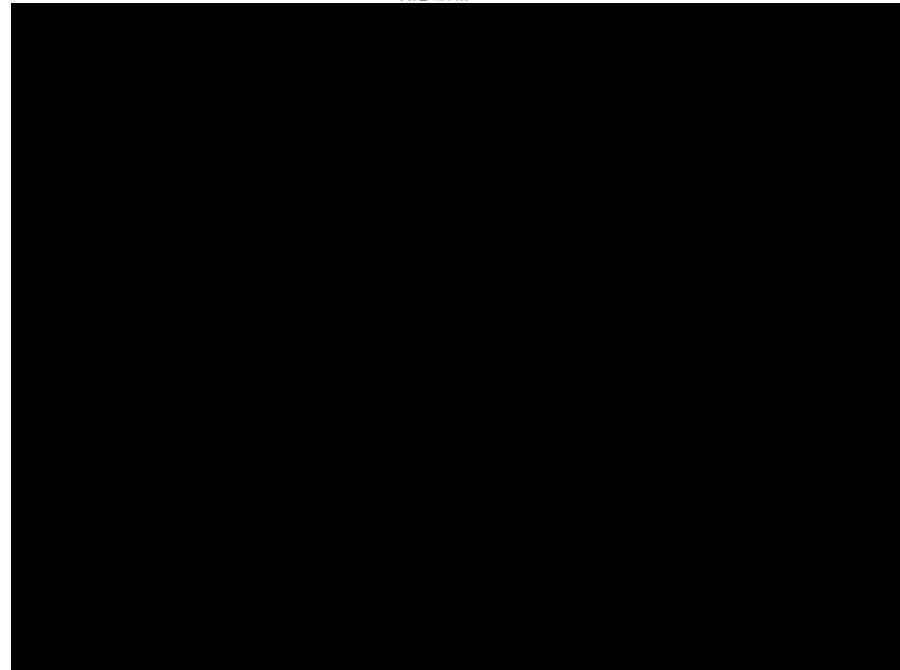
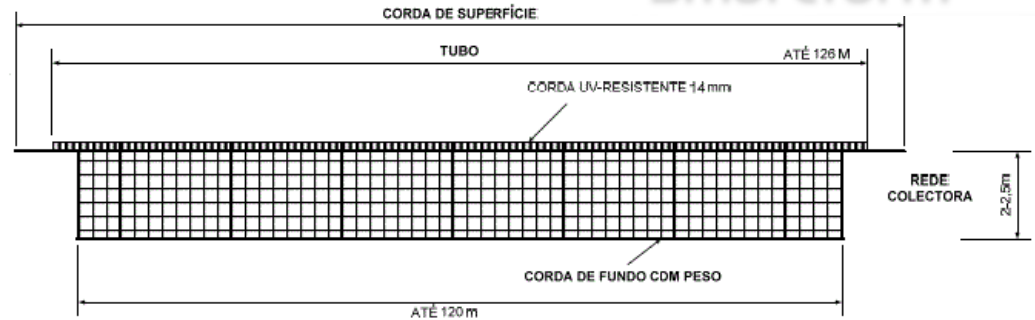
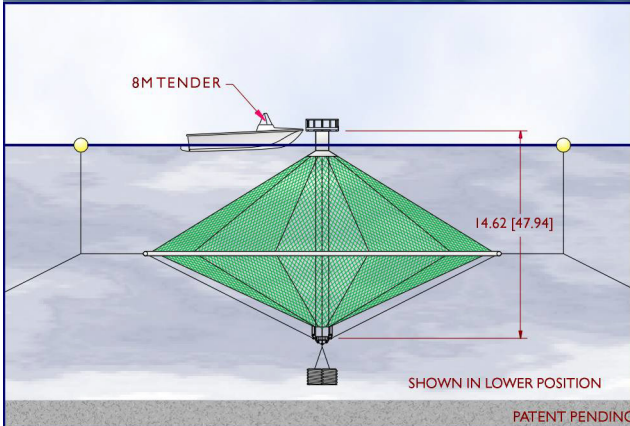
New Technologies – New Opportunities

➤ **Production** – The new off-shore areas of production – ALGARVE - APPAA



Castro 2008

New Technologies – Off-shore



Species under research



Dusky Grouper
Epinephelus marginatus



White Seabream
Diplodus sargus sargus



Seabass
Dicentrarchus labrax



Common two-banded
Seabream
Diplodus vulgaris



Seabream
Sparus aurata



Zebra Seabream
Diplodus cervinus cervinus



Meagre
Argyrosomus regius



Sharpsnout Seabream
Diplodus puntazzo

Species under research (cont.)



Senegalese Sole
Solea senegalensis



Blackspot Seabream
Pagellus bogaraveo



Turbot
Scophthalmus maximus



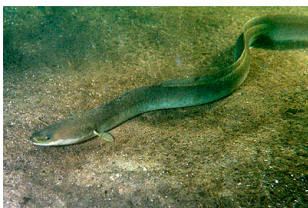
Red Porgy
Pagrus pagrus



Rainbow Trout
Oncorhynchus mykiss



Greater Amberjack
Seriola dumerili



European Eel
Anguilla anguilla



White Trevally
Pseudocaranx dentex

Species under research (cont.)



Short-snouted Seahorse
Hippocampus hippocampus



European Cuttlefish
Sepia officinalis



Long-snouted Seahorse
Hippocampus guttulatus



Common Octopus
Octopus vulgaris



Broadnose Pipefish
Syngnathus typhle



Portuguese Oyster
Crassostrea angulata



Atlantic Ditch Shrimp
Palaemonetes varians



European Flat Oyster
Ostrea edulis

Species under research (cont.)



Grooved Shell Clam
Ruditapes decussatus



Common Cockle
Cerastoderma edule



Pullet carpet shell
Venerupis pullastra



Pod Razor Shell
Ensis ensis



Atlantic Surf Clam
Spisula solida



Sword Razor Shell
Ensis siliqua



Wedge Shell
Donax trunculus



Blue Mussel
Mytilus spp.

Potential Species



Goose Barnacle
Pollicipes pollicipes



Great Scallop
Pecten maximus



Purple Dye Murex
Bolinus brandaris



Bonded Murex
Hexaplex trunculus



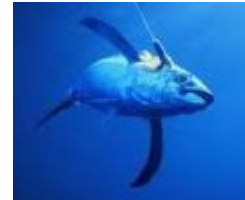
Monk fish
Lophius piscatorius



Bluefin Tuna
Thunnus thynnus



Yellowfin Tuna
Thunnus albacares



Albacore Tuna
Thunnus alalunga

Potential Species (cont.)



Spiny Lobster
Palinurus elephas



Spyder Crab
Maja brachydactyla



European Lobster
Homarus gammarus



Edible Crab
Cancer pagurus

Aquaculture-related Research Institutes



www.cimar.org



www.inrb.pt/ipimar



www.ccmар.ualg.pt



www.cimar.org/CIIMAR/en/index.htm



www.cmcmadeira.org/Maricultura-287.aspx

Areas of Research:

Metabolism

Zoo-technology

Reproduction

Feed Stuffs

New Species

Nutrition

Pathology

Larval Stages

Genetics

Why come here to do your PhD or MSc?

- Top Researchers
- Top Laboratory Facilities
- Broad Areas of Research
- Large Group of Species
- ...but most of all...GREAT WEATHER



How to apply

Short-term visit:



ec.europa.eu/education/lifelong-learning-programme/doc80_en.htm



www.aquatt.ie 



www.assemblemarine.org/



How to apply (cont.)

Long-term visit:

➤ Marie Curie Actions

cordis.europa.eu/fp7/mariecurieactions/home_en.html



➤ Portuguese Foundation for Science and Technology



alfa.fct.mctes.pt/apoios/bolsas/index.phtml.en

➤ EURAXESS

www.euraxess.pt/



Questions?

