



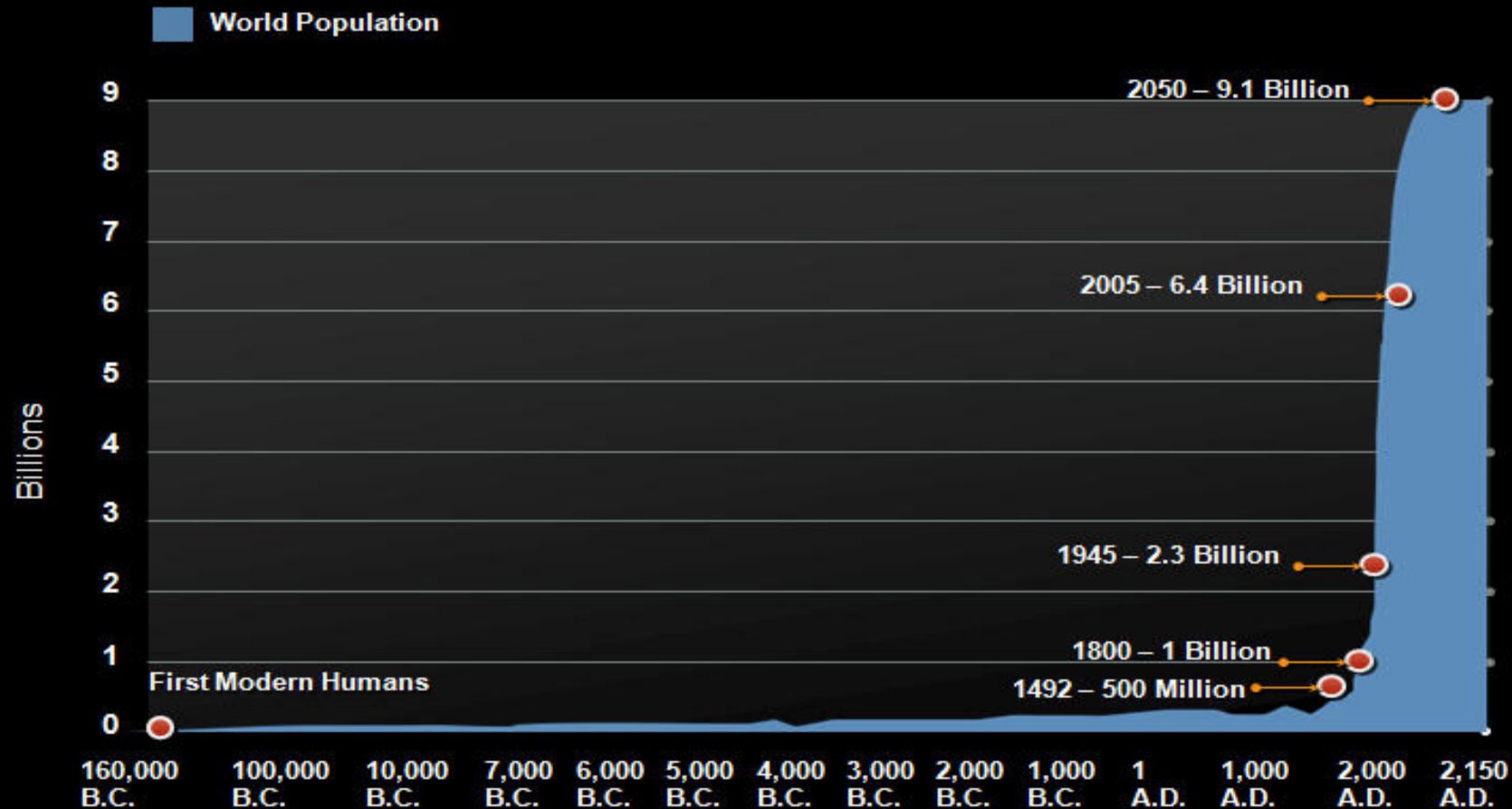
MAINE AQUACULTURE ASSOCIATION

NATIONAL AQUACULTURE RESEARCH NEEDS

An Industry Perspective

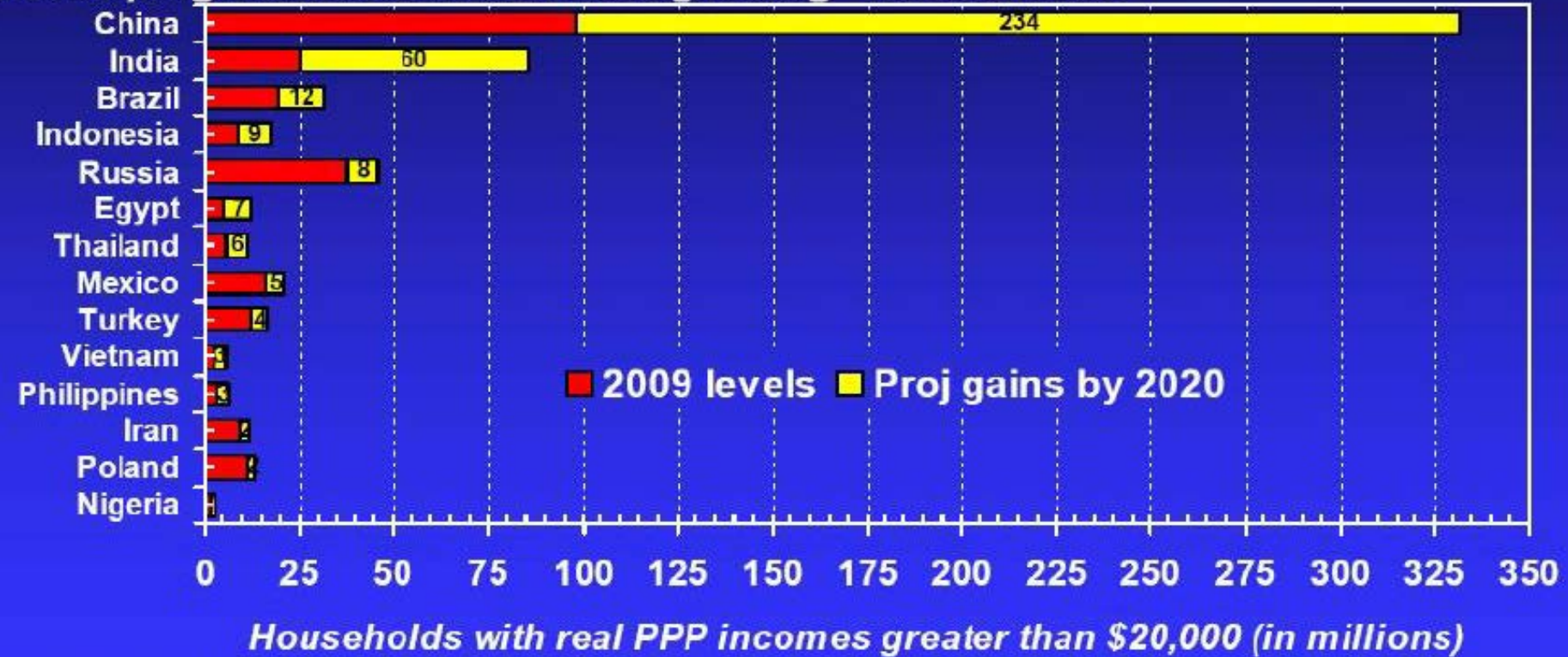
**SINCE 1950 WE HAVE CONSUMED 2X THE RESOURCES
THAN ALL PRIOR HISTORY COMBINED**

Population Growth Throughout History



ISING LIVING STANDARDS

Developing countries with fastest growing "middle class"



Source - USDA Foreign Agricultural Service



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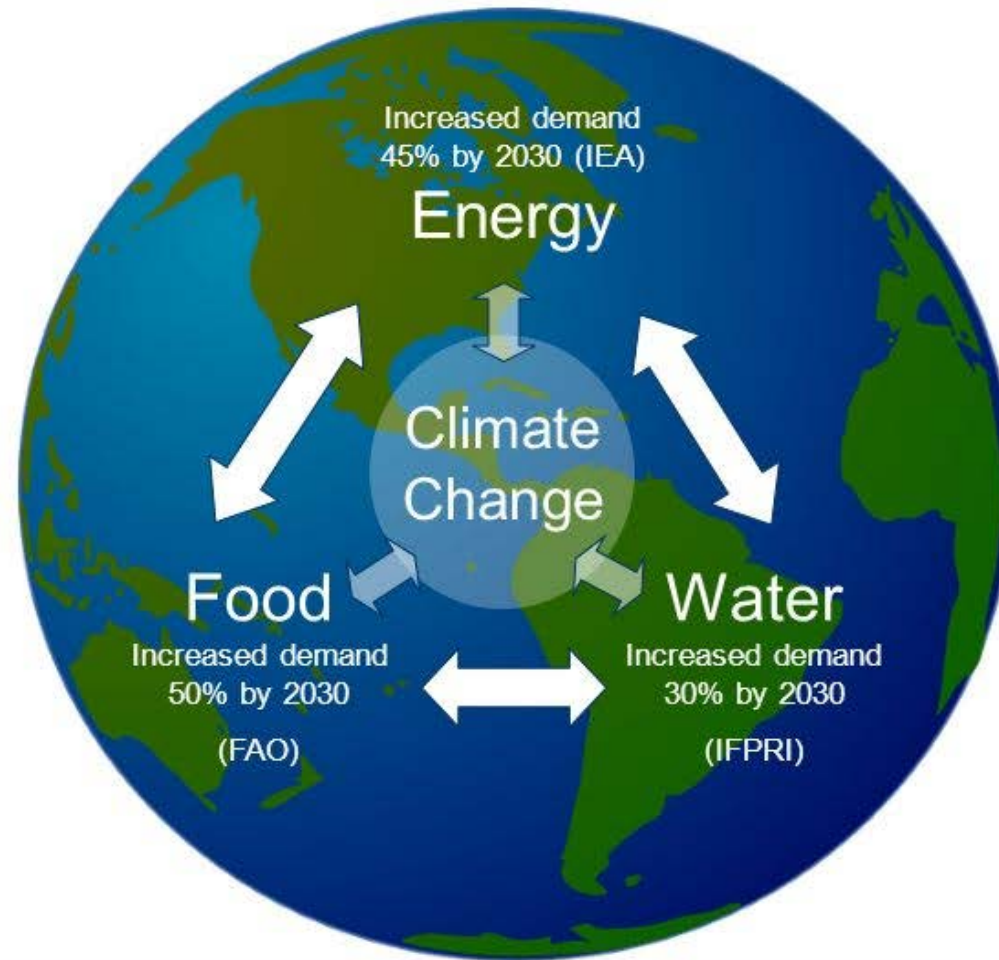
WATER - NUTRIENTS



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Global food system – Future projections

1. Increasing population
2. Changing diets
3. Losing land to urbanisation and rising sea levels
4. Water limits
5. Phosphorous limits



EFFICIENCIES OF DIFFERENT ANIMAL PROTEIN SECTORS

FOOD AND FRESH WATER REQUIREMENTS TO PRODUCE 1KG



***8 kg feed
1857 gallons***



***3 kg feed
756 gallons***



***2 kg feed
469 gallons***



***1.1 kg feed
132 gallons***

***Aquatic organisms 10-20% more efficient than land animals
at converting energy, water and feed to meat and protein***

WHY?

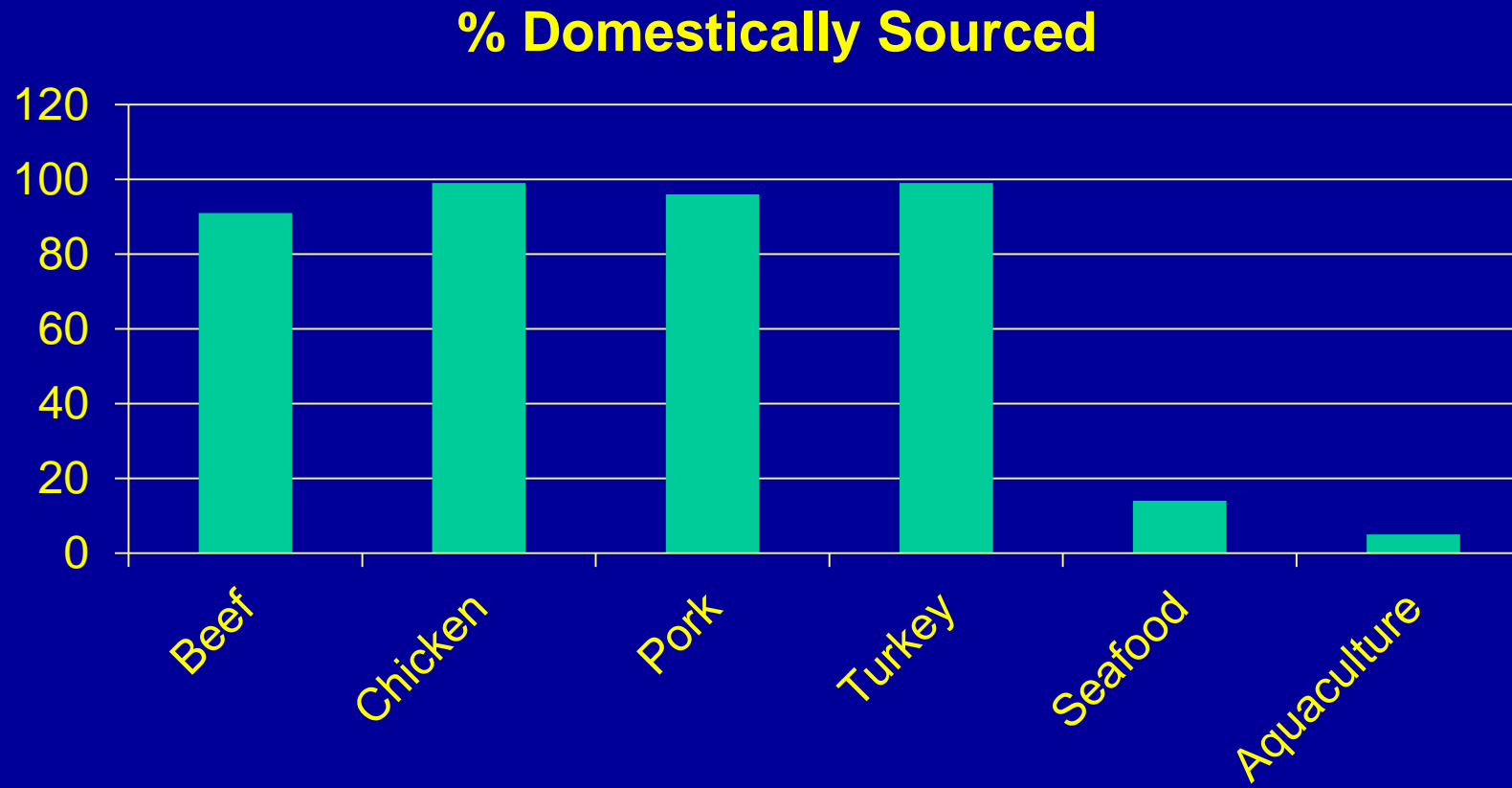
MORE ON EFFICIENCIES AND IMPACTS

YIELDS AND RETENTION RATES FOR VARIOUS ANIMALS

	ATLANTIC SALMON	PIGS	CHICKEN	LAMB
HARVEST YIELD (%)	86-92	72.5	65.6	46.9
ENERGY RETENTION(%)	23	14	10	5
PROTEIN RETENTION (%)	31	18	21	5

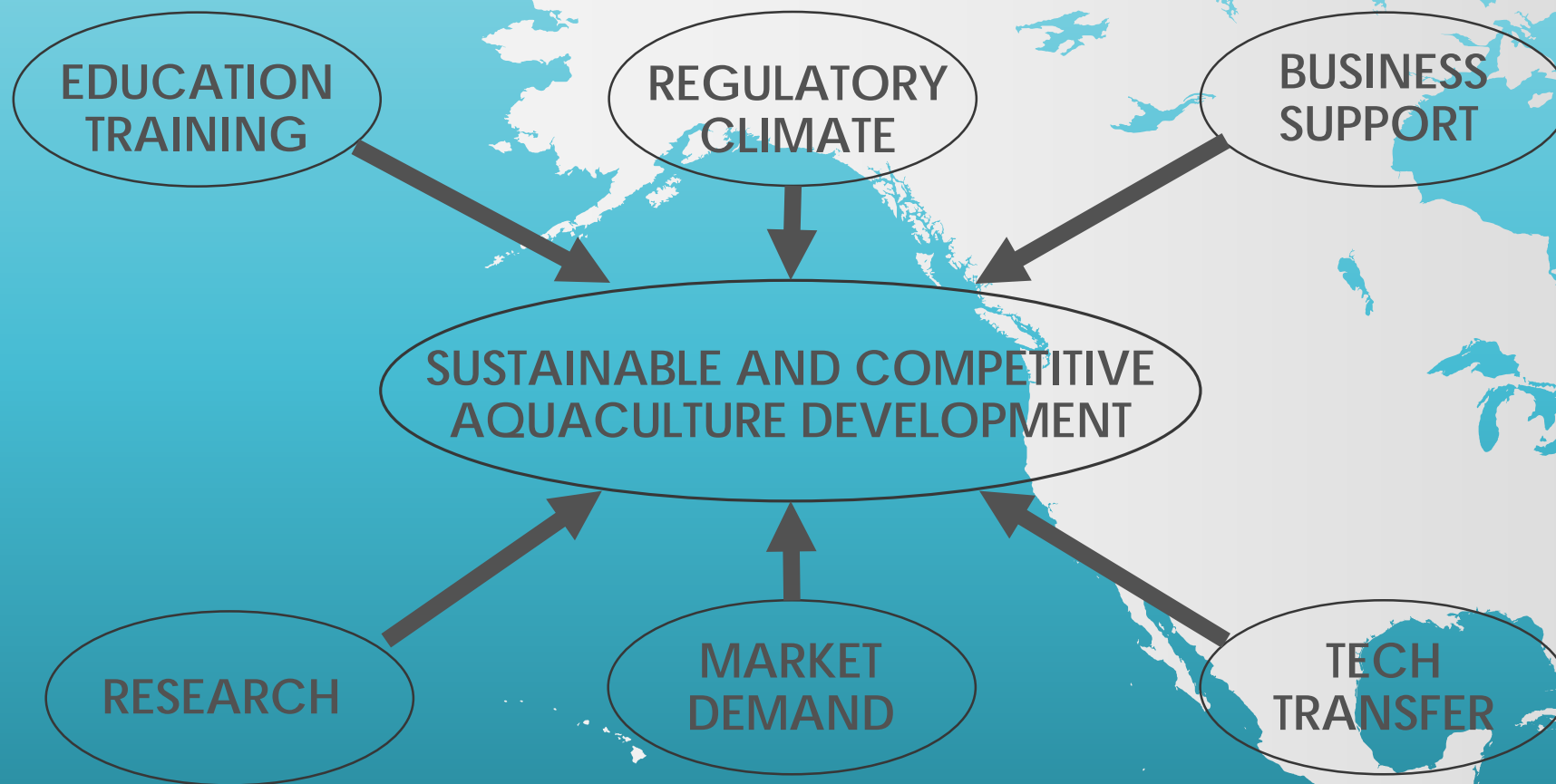


SHARE OF U.S. CONSUMPTION SUPPLIED BY DOMESTIC PRODUCTION





KEY COMPONENTS OF AQUACULTURE DEVELOPMENT





COMMON "TYPES" OF AQUACULTURE RESEARCH PROGRAMS

- SHORT/MEDIUM TERM "FAST" RESPONSE
- LONG TERM PROGRAMS
- REGIONAL FOCUSED
- SPECIES FOCUSED
- BOTTLENECK/CHALLENGE FOCUSED
- PRODUCTION METHOD FOCUSED



National Strategic Plan For Federal Aquaculture Research (2014-2019)

9 Strategic Goals

- Advance Understanding of the Interactions of Aquaculture and the Environment
- Employ Genetics to Increase Productivity and Protect Natural Populations
- Counter Disease in Aquatic Organisms and Improving Biosecurity
- Improve Production Efficiency and Well-Being
- Improve Nutrition and develop Novel Feeds
- Increase Supply of Nutritious, Safe, High-quality Seafood and Aquatic Products
- Improve Performance of Production Systems
- Create a Skilled Workforce and Enhance Technology Transfer
- Develop and Use Socioeconomic and Business Research to Advance Domestic Aquaculture



ROLE OF RESEARCH IN NATIONAL AQUACULTURE DEVELOPMENT

- REGULATORY AND MANAGEMENT CONCERNS
- “SPARING” CAPITAL
- REDUCING RISK
- REDUCING VARIABILITY....INCREASING PREDICTABILITY
- INCREASING PRODUCTION EFFICIENCY
- INCREASING ROI
- PRODUCT/METHOD “PROSPECTING”
- INNOVATION
- IMPROVING PUBLIC UNDERSTANDING/PERCEPTION



INDUSTRY AQUACULTURE RESEARCH "PRIORITIES" 2018

- GENETICS
- ANIMAL/PLANT HEALTH AND WELFARE
- NUTRITION
- ENGINEERING/TECHNOLOGY
- SPECIES ASSESSMENT
- FARM/ENVIRONMENT INTERACTIONS
- PRODUCT DEVELOPMENT
- MARKET DYNAMICS AND CONSUMER PREFERENCES
- RISK ANALYSIS AND MANAGEMENT
- FARM/PRODUCTION PLANNING AND MANAGEMENT
- REGULATORY COSTS AND DUPLICATION