



SEPTEMBER 2010

# BIO-BASED PRODUCTS

## - WHAT'S IN IT FOR EUROPE

STEEN RIISGAARD, CEO NOVOZYMES

- THE KBBE TOWARDS 2020 CONFERENCE

  
novozymes  
Rethink Tomorrow

# NOVOZYMES IN BRIEF



## GLOBAL PRESENCE

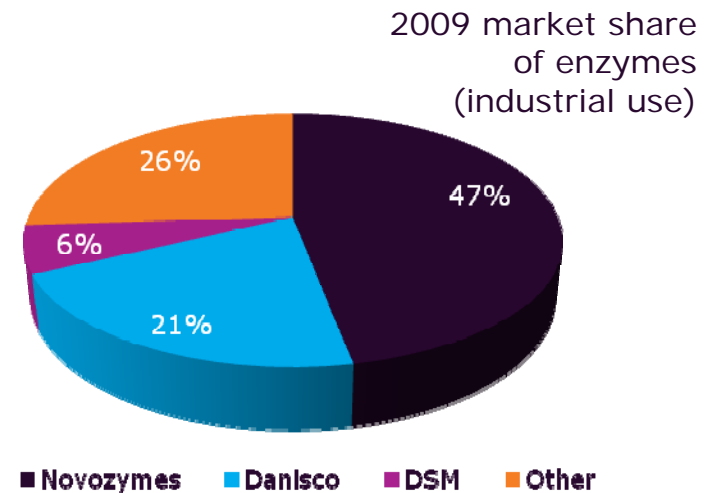
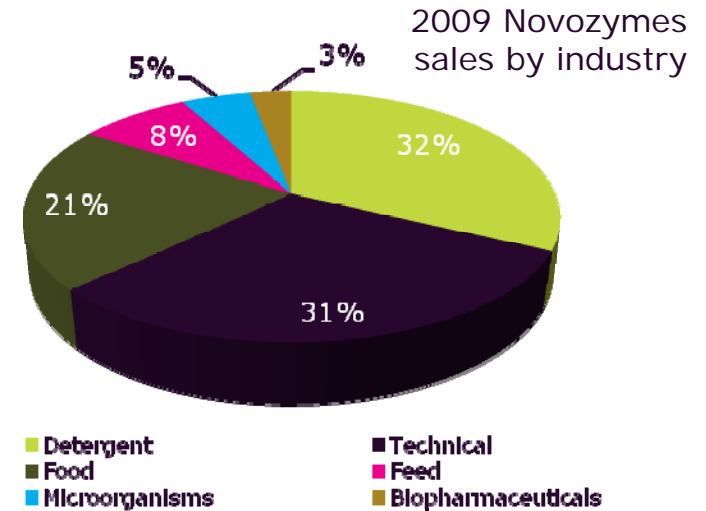
- Global leader in Industrial Enzymes & Microorganisms
- More than 700 products used in 130 countries within >30 different industries
- 5,200 employees worldwide

## R&D

- Market leader in all main industries
- 47% global market share within industrial enzymes
- ~14% of sales invested in R&D
- >6,000 patents in place

## PERFORMANCE

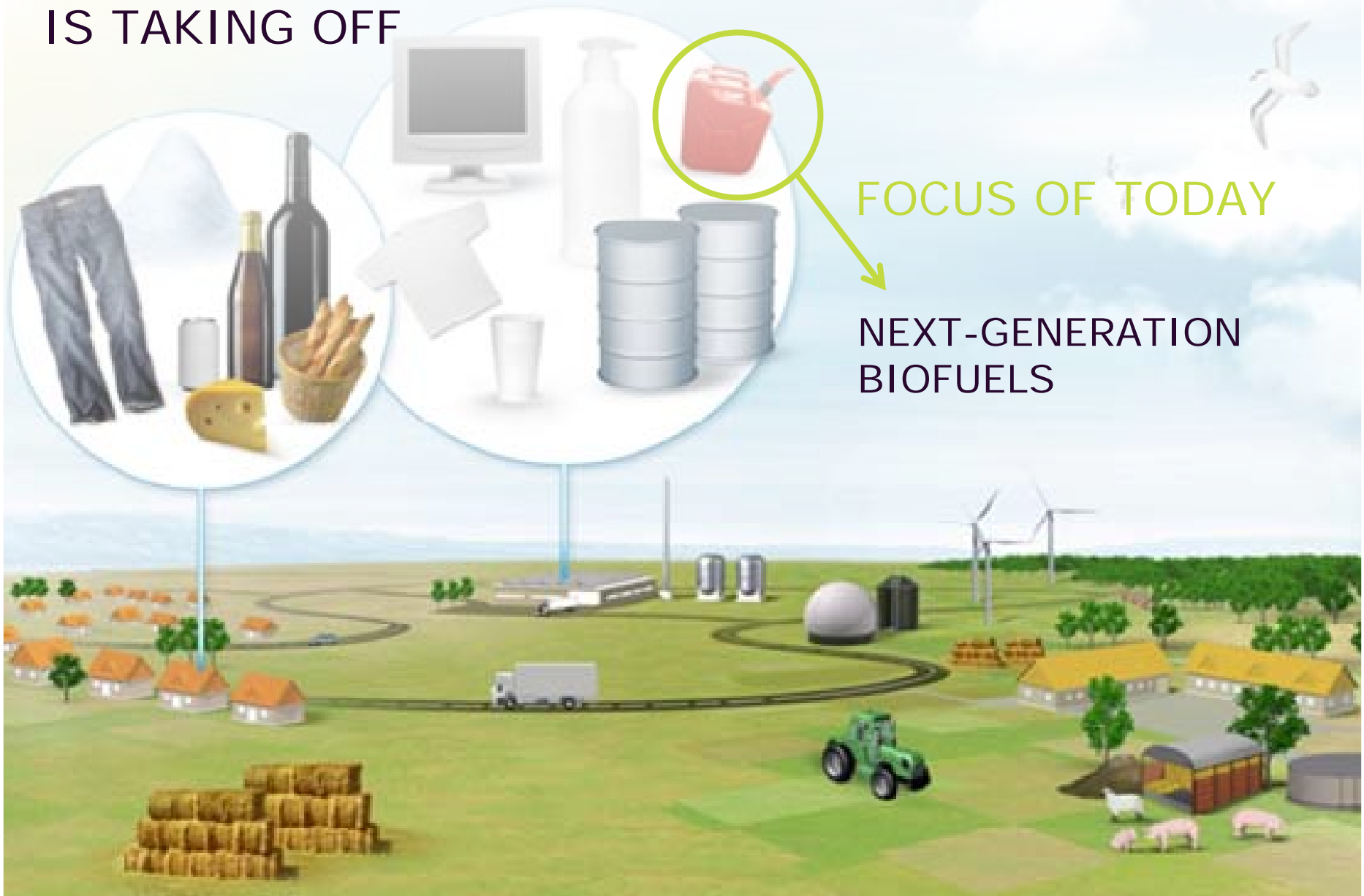
- 2009 global sales USD 1.6B (FY 2009)
- Operating profit margin 20% (FY2009)
- ROIC 20.3% (FY2009)



# THE ERA OF FOSSIL FUELS IS RUNNING OUT



... AND THE BIO-BASED ECONOMY IS TAKING OFF



FOCUS OF TODAY

NEXT-GENERATION  
BIOFUELS

# NEXT-GENERATION FROM WASTE AND RESIDUES

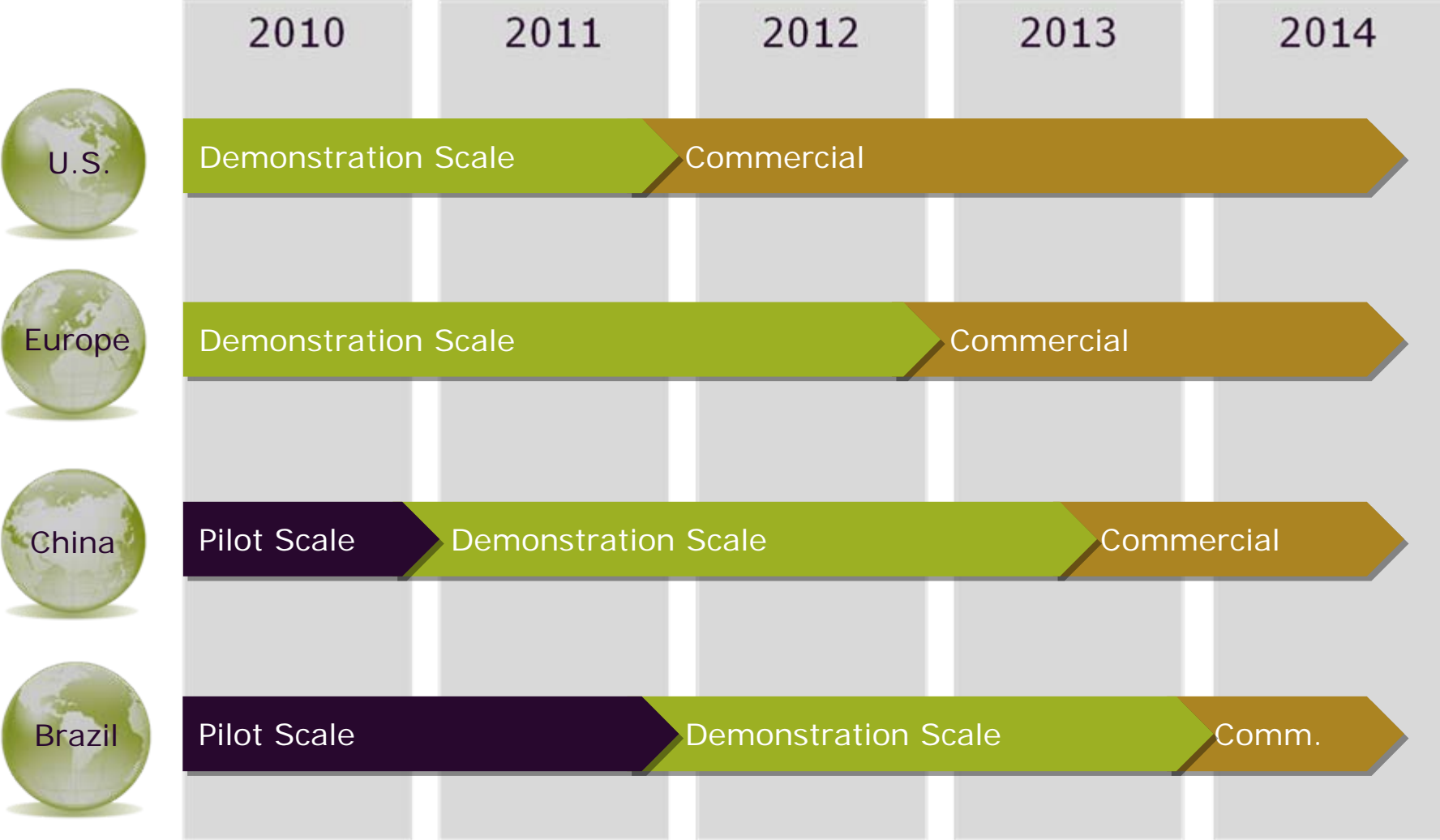
## Next-generation biofuels produced from:

- Agriculture residues
- Forestry residues
- Cultivated energy crops
- Municipal solid waste

Commercialization happens in regions with conducive policy conditions

Novozymes first company to supply large quantities of enzymes to produce next-generation biofuels

# THE TECHNOLOGY IS READY AND PRODUCTION IS BEING SCALED UP



# NEW STUDY: A GOLDEN OPPORTUNITY FOR EUROPE

- Bloomberg New Energy Finance has assessed the potential for next-generation biofuels and biochemicals in Europe from 2010 to 2020
- Less than 25% of the available biomass converted without changing land use patterns
- Up to 1 million jobs, economic growth, mitigate GHG emissions and reduce energy dependency
- A number of barriers exist so policy support is needed to realize potential



# BENEFITS FOR EUROPE



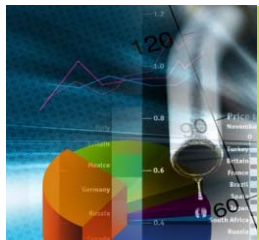
## Energy security

EU can replace 62% of its annual gasoline consumption by 2020 with next-generation biofuels



## Jobs

Create ~1 million jobs between 2010 and 2020 mainly non-outsourcable jobs in rural areas



## Economy

Generate 31 bn € in sales rather than spending EUR 49bn on oil import



## Environment

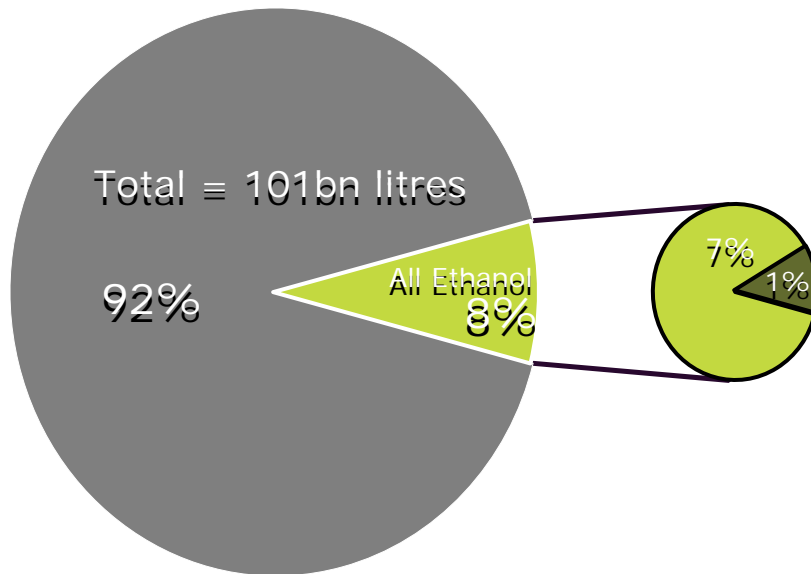
Save 122m tonnes of CO2 and reducing GHG emission from road transport with 50%



# ENERGY SECURITY

EU27 "business-as-usual" 2020  
forecast gasoline market demand

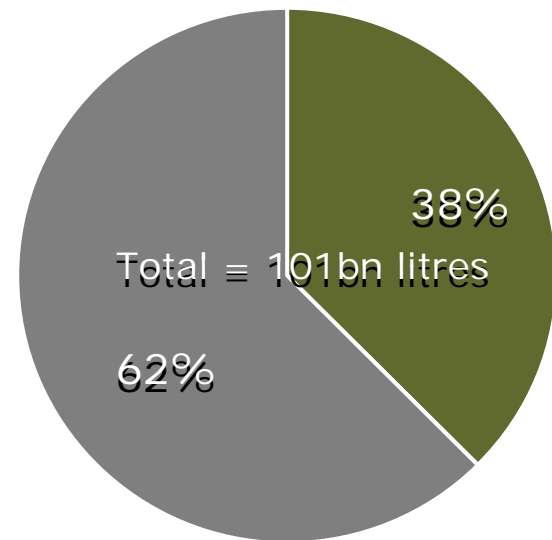
% - billion litres



- Fossil gasoline
- First-generation ethanol
- Next-generation ethanol

EU27 "Bull" 2020 forecast  
gasoline market demand

% - billion litres

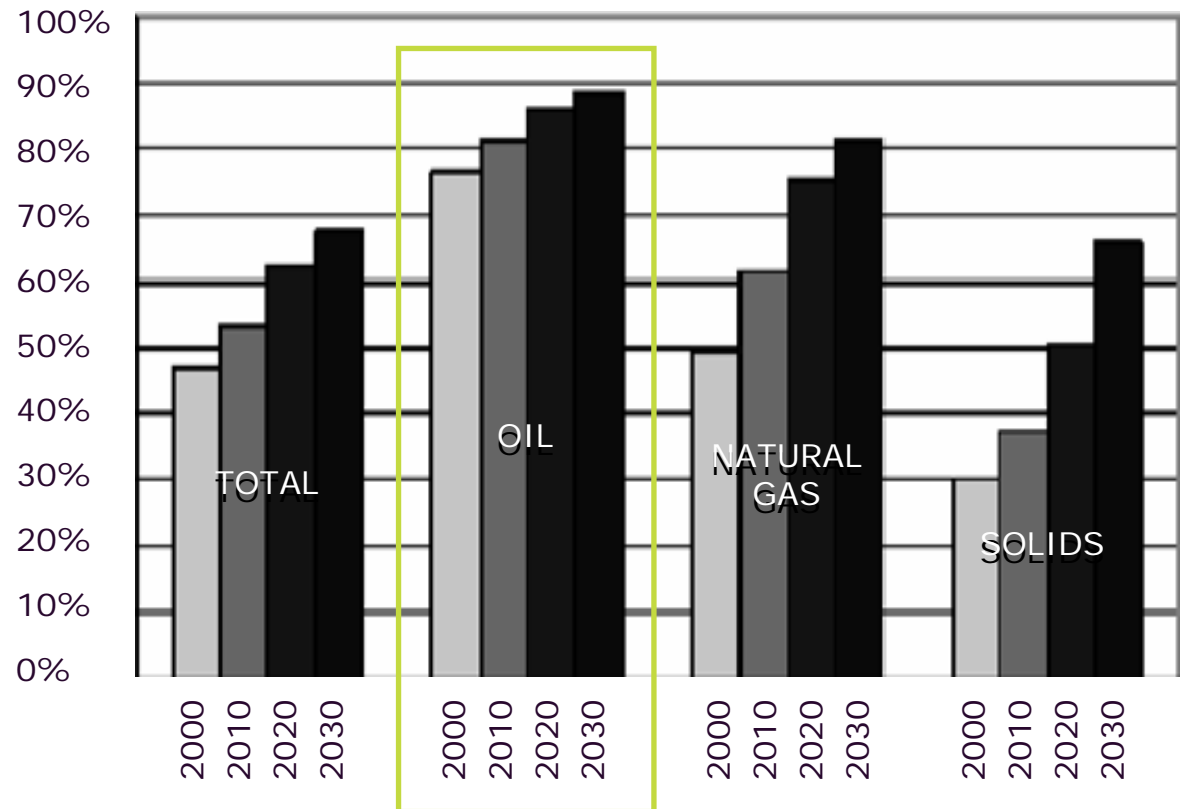


- Gasoline
- Next-generation ethanol

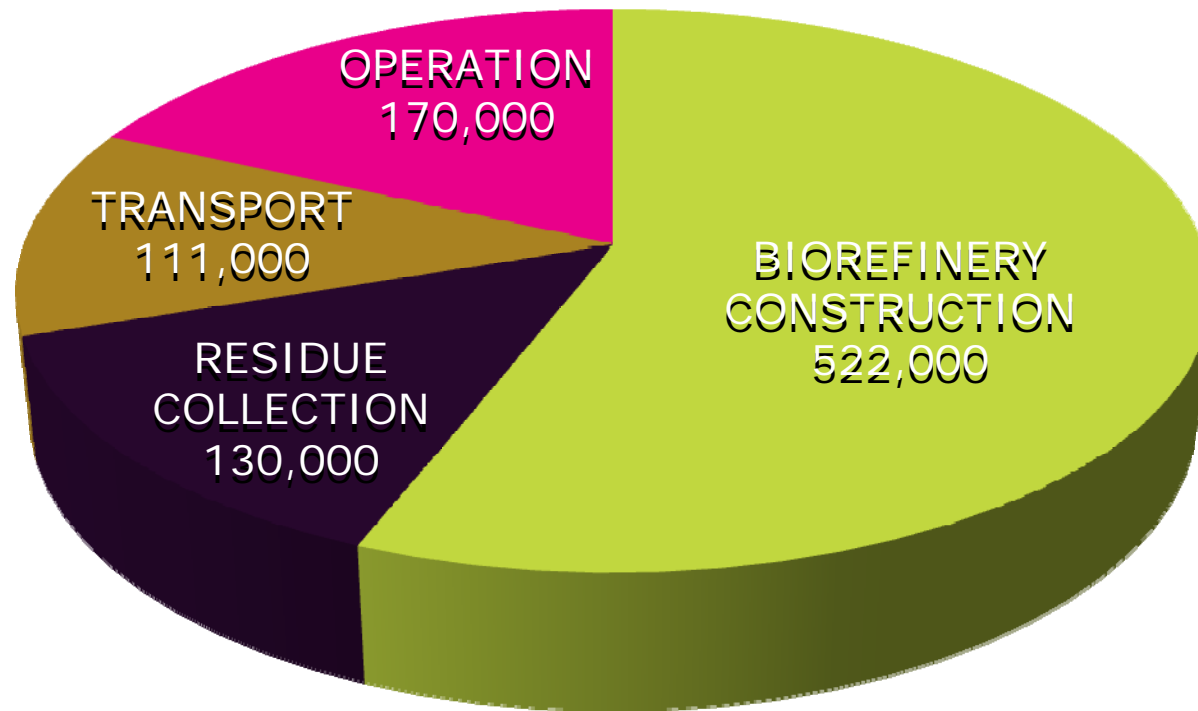
# ENERGY SECURITY

- Left unchecked, Europe's import dependency will grow rapidly
- Dependency is highest for oil
- Europe can replace 62% of its gasoline consumption with next-generation biofuels

## Import dependency for Europe

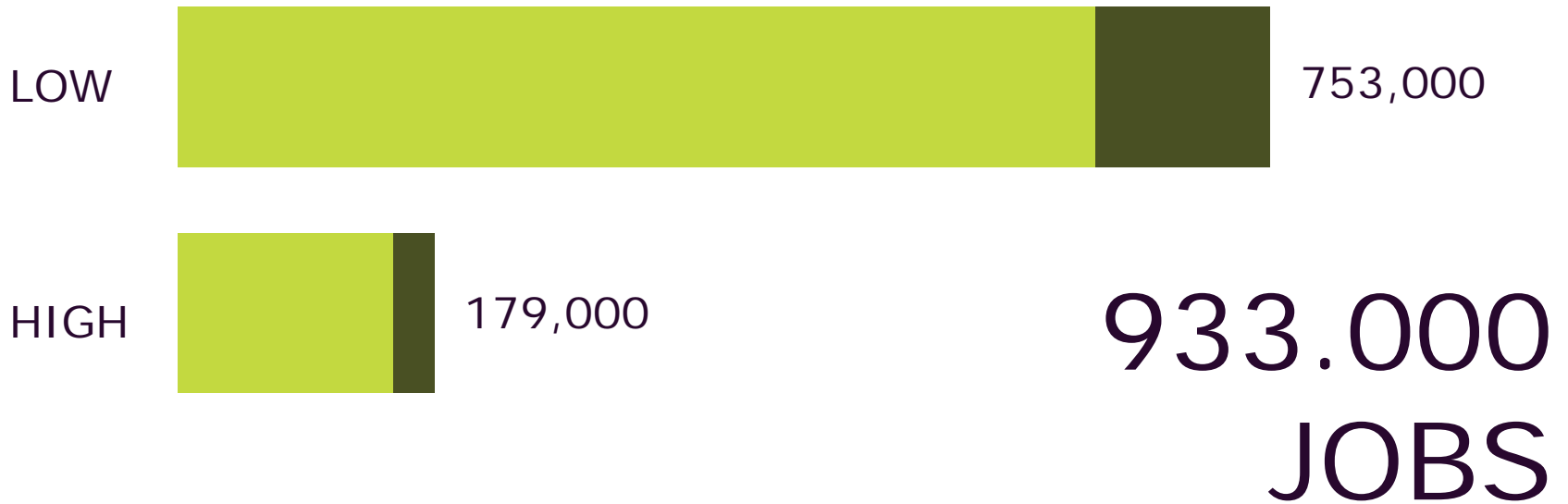


# JOBS: UP TO 1 MILLION JOBS IN EUROPE BY 2020



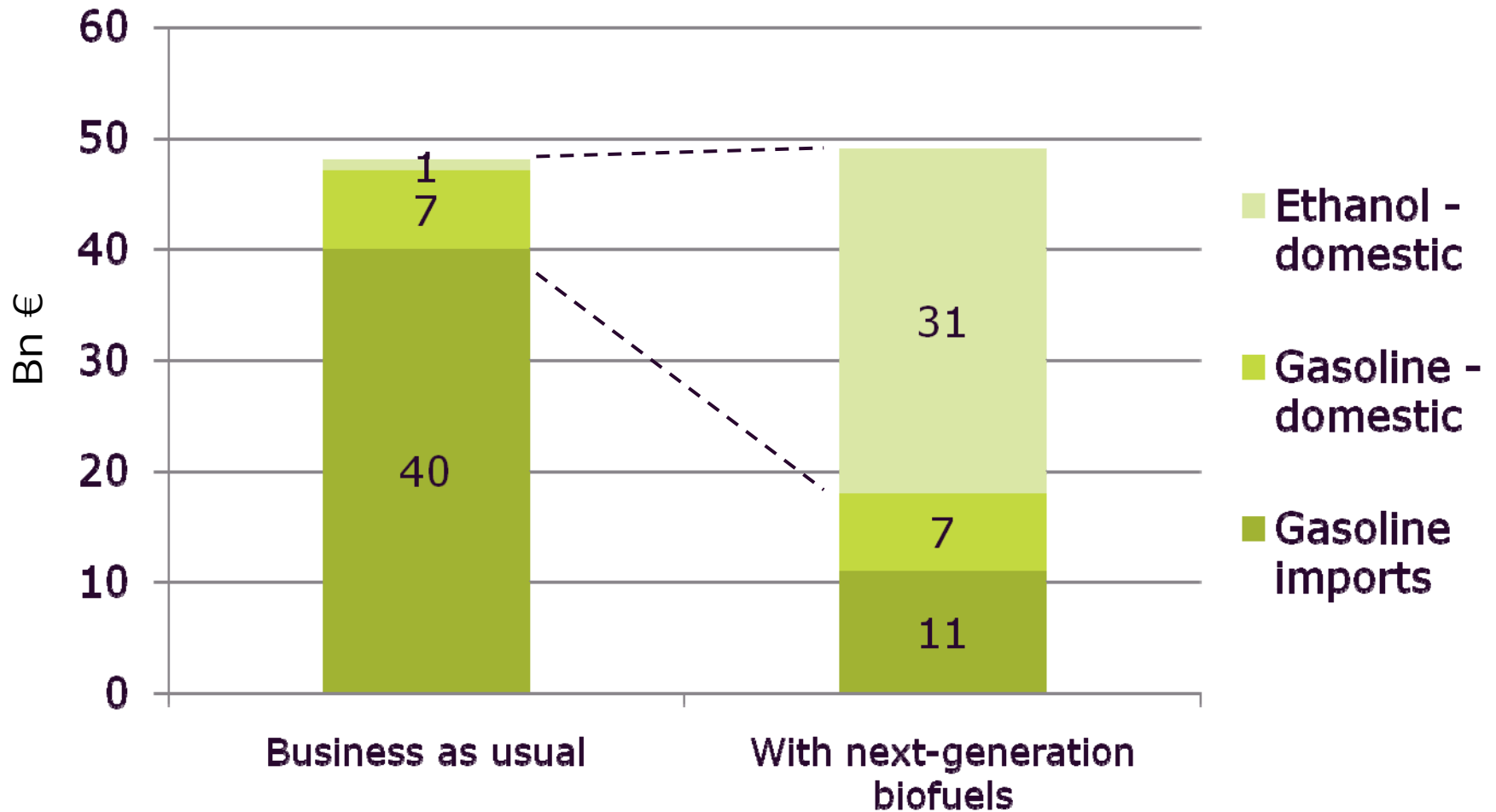
# JOBS: SKILL TYPE

## NUMBER OF JOBS



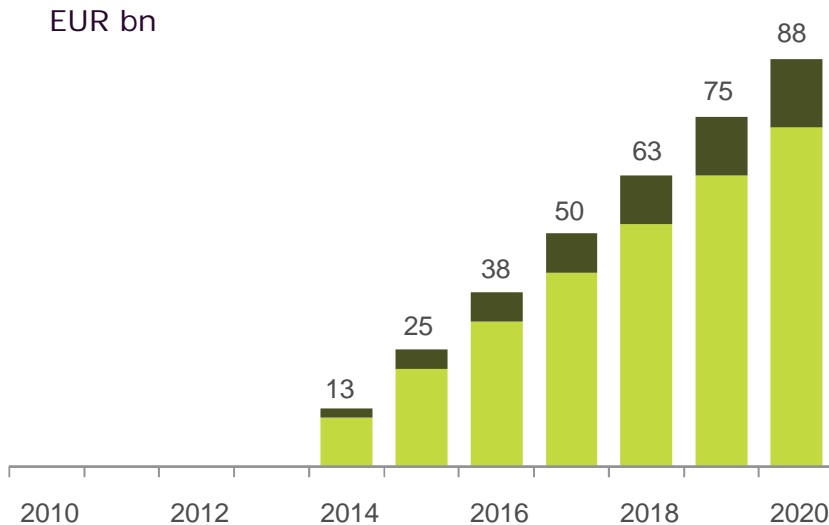
- BASE CASE SCENARIO
- BULL SCENARIO

# ECONOMY: SPURRING GROWTH



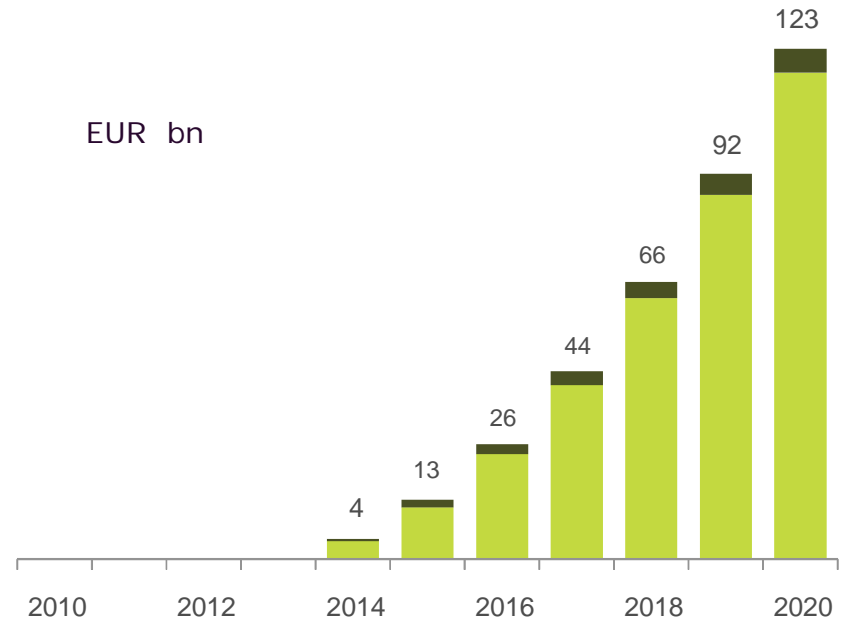
# ECONOMY: SOUND INVESTMENT

- Total cumulative next-generation biofuels capacity investment, 2010 to 2020



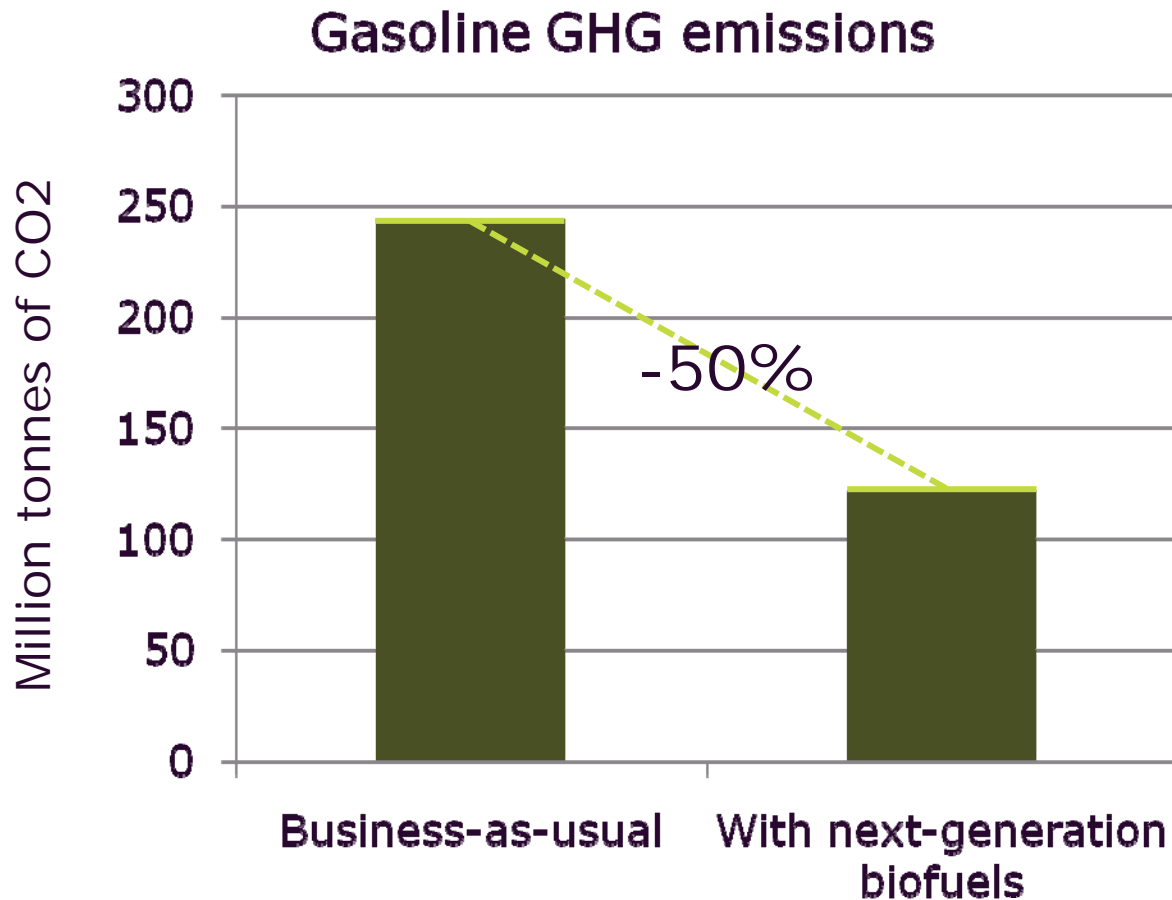
■ BASE CASE SCENARIO  
■ BULL SCENARIO

- Total cumulative next-generation biofuels revenues



■ BASE CASE SCENARIO  
■ BULL SCENARIO

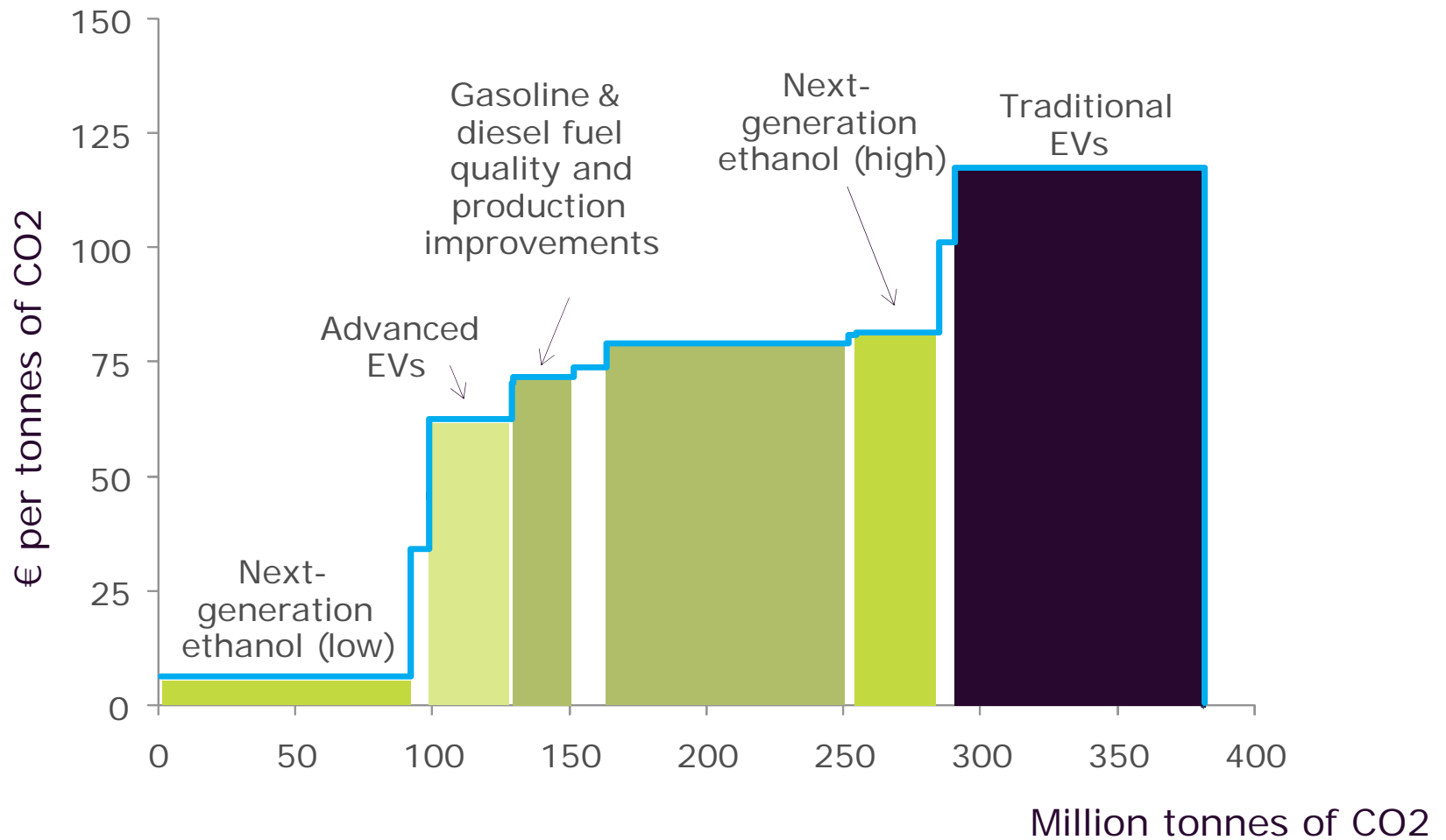
# ENVIRONMENT: 50% GHG REDUCTIONS IN ROAD TRANSPORT



- Next-generation biofuels to reduce CO2 emissions in transport sector with 50%
- 30 million cars off the roads in Europe

# ENVIRONMENT: COST EFFECTIVE

  
novozymes  
Responsible  
Business  
**NOTE: find out  
reason for  
range**





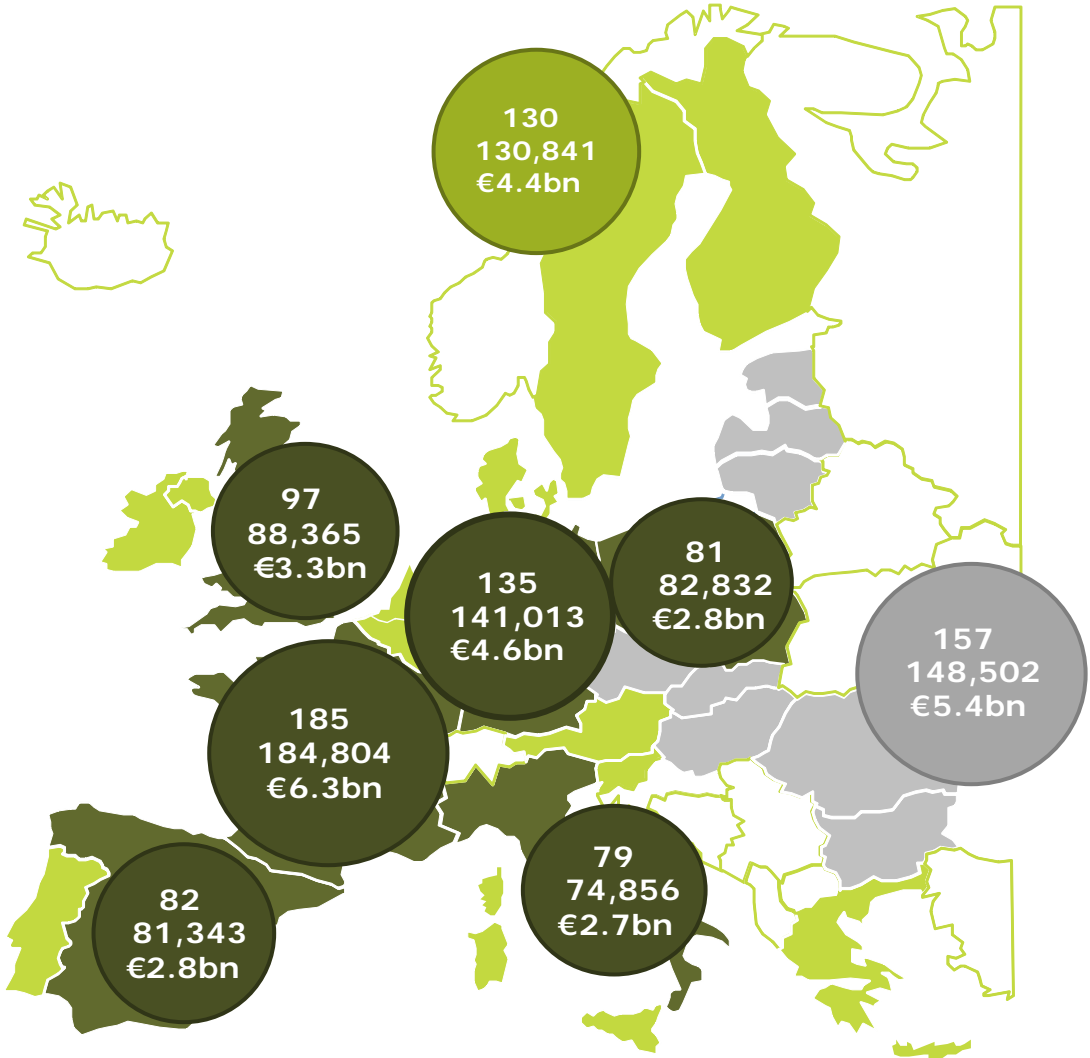
# SUMMING UP: WHAT'S IN IT FOR EUROPE?

**Key**  
 Refineries  
 Jobs  
 Revenue

 Top 6

 Other States

 New Member States



Source: Bloomberg New Energy Finance study – 'Bioproduct market potential', September 2010

# BARRIERS

- No market for residues
- Biomass residue infrastructure required
- Conversion economics will fall
- Technical blending hurdles
- Capital shortage
  
- Main barrier is the perceived investment risk in *an uncertain policy environment with no clear incentives*

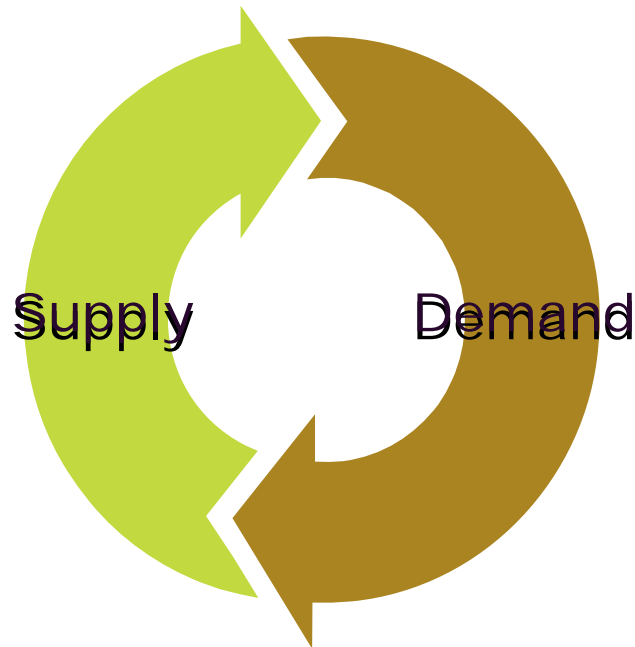
# POLICY REQUIREMENTS

## Guiding principle

- Secure demand early and set ambitious target to provide investor confidence
- Support production simultaneously to lower the cost in a short period

### Support Production

- 1 Loan guarantees
- 2 Production subsidies for early stage plants
- 3 Support biomass development and collection through EU farm policies



### Secure Demand

- 4 Mandatory blending targets
- 5 Remove technical barriers e.g. blend walls

# NEXT-GENERATION BIOFUELS IS DRIVING THE INFRASTRUCTURE TOWARDS THE BIO-BASED ECONOMY



# INCREASED FOCUS ON THE BIO-BASED ECONOMY...



Thank you

Join the dialog...

[www.bioenergy.novozymes.com](http://www.bioenergy.novozymes.com)