

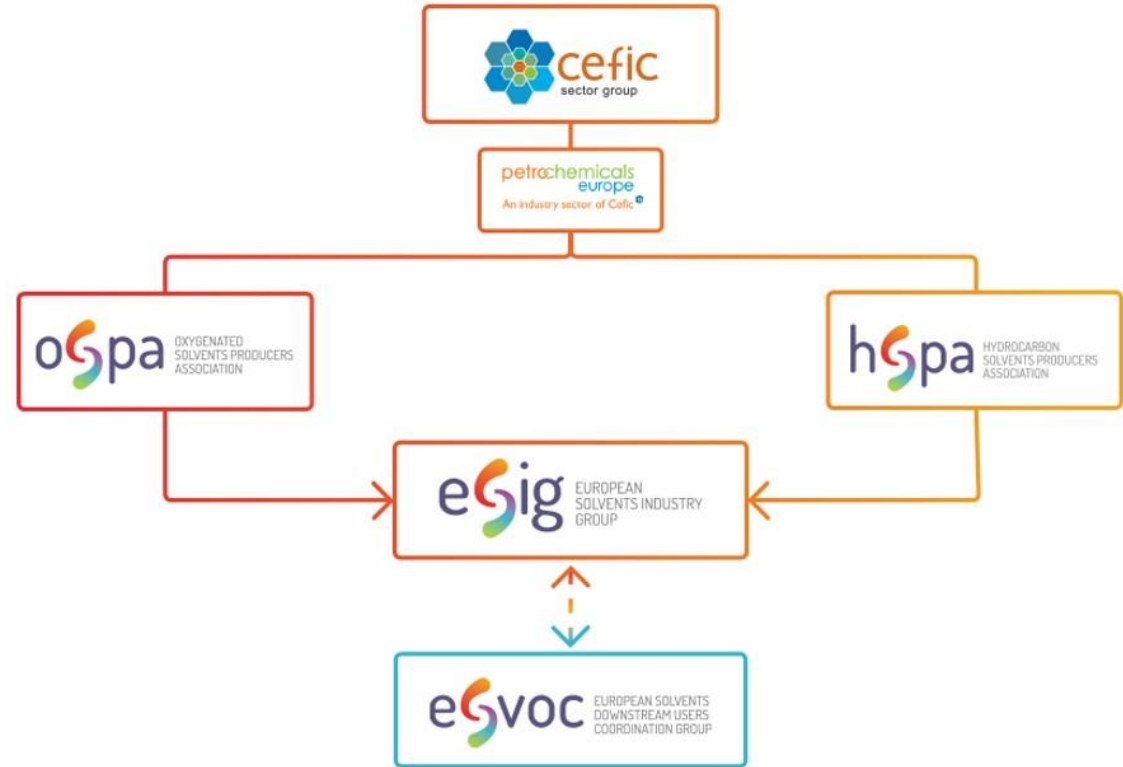
# ESIG

## SOLVENT VOC INVENTORIES



# EUROPEAN SOLVENTS INDUSTRY GROUP

ESIG IS A JOINT ACTIVITY OF  
 OSPA (OXYGENATED)  
 AND HSPA (HYDROCARBON)  
 SOLVENTS PRODUCERS  
 ASSOCIATIONS



# EUROPEAN SOLVENTS INDUSTRY GROUP

**Commitment to Responsible Care**



**Product Stewardship**

**Communication**

**Advocacy**

**Air Quality**

**Supporting Science  
Solvents VOC  
inventories**

**Visibility**



**Regulatory Monitoring  
substance defence**



# OUR INVENTORIES

## STARTING POINT

### 2011

Industry thought that reported NMVOC emissions from solvents looked rather on the high side & started to derive own data based on solvents sales for 2008 & 2009

Next collection only started with 2013 data

### 2017

Since 2015 we have complete time series & continuously improved the inventories



# OUR INVENTORIES

## BASIC PRINCIPLE & ADAPTIONS UNTIL 2021

- collect sales data from ESIG members for oxygenated & hydrocarbon solvents in scope reported per member state and into REACH end use categories
  - import/export corrections
  - derive emissions per country per REACH end use category
- 
- REACH end use categories have been matched to NFR categories
  - ethanol emission have been added



# Methodology

Stepwise approach:

- Solvent sales data collected per MS
- Import to & export from each MS estimated
- Ethanol use added
- Emission factors applied (one estimate per REACH end-use category)

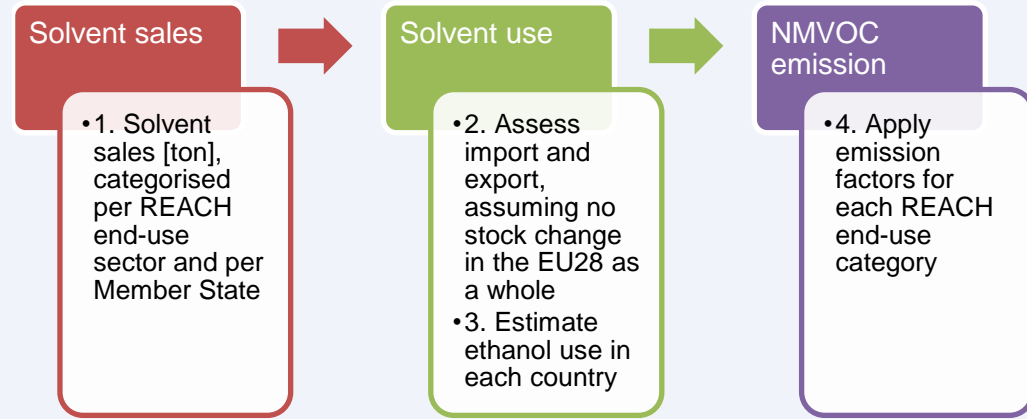
Production equals use, which assumes:

- No import to/export from the EU28 (27) as a whole
- No stock changes

Details:

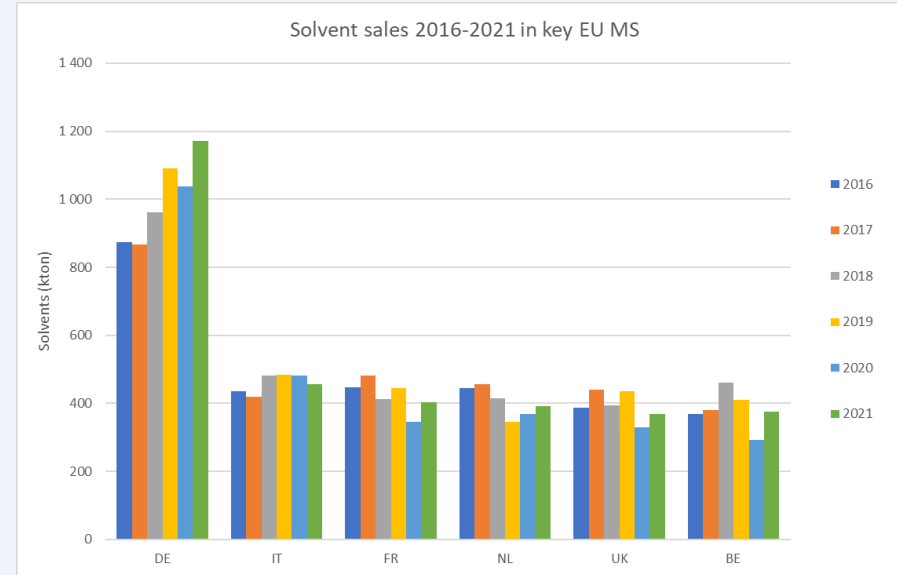
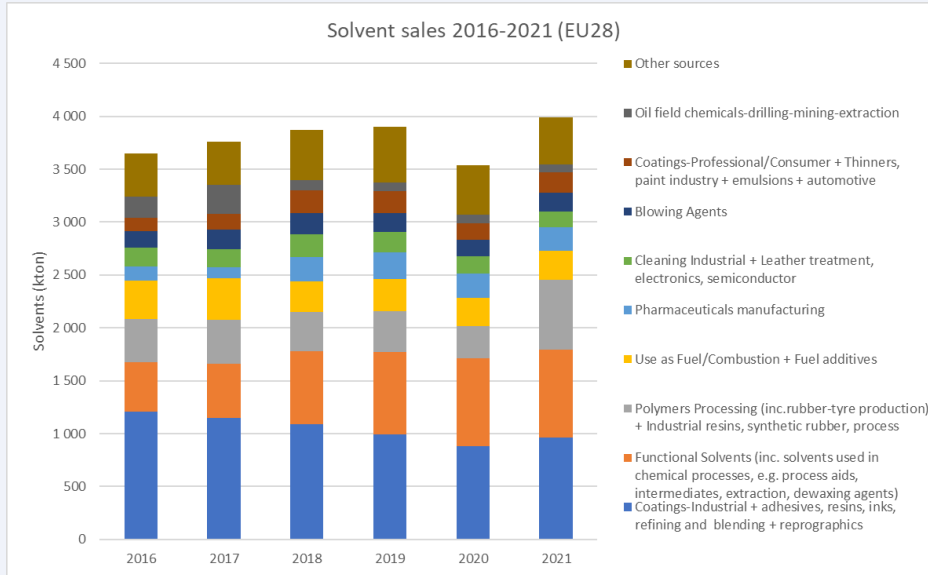
[ESIG technical paper solvent VOC emissions 2021](#)

[Pearson, Atmospheric Environment, 2019](#)



# Solvent sales

- Solvent sales in each MS vary from year to year
  - Even in countries where a lot of solvents are used, changes of 10% or more are not uncommon from year to year
  - For smaller countries such differences may be significantly larger => use import/export to smoothen this



# Import and Export estimation

- Data indicate where the solvents are SOLD
  - The use of these solvents may take place in different places
  - Free flow of goods within EU => transfer to different countries
- Import and export of solvents between Member States largely based on expert judgement for inventories until 2016-2017
  - Other alternatives explored but with lack of data very difficult
  - Import/export shares were initially estimated at country group level, now disaggregated to individual country level
  - Causes changes in historical years' emissions, especially for smaller countries

- **Basic assumptions for 2013-2017**
  - Three main net exporters (NL, BE, DE): each exporting more than 50% of "their" solvents
  - Some countries considered net zero: FR, UK, IE
  - All other countries are net importers
- **For 2018-2021**
  - In principle the same shares of net import (%)
  - Deviate only where large changes in production happen (>10-15%)
  - Compensate this with the countries that have only small changes to balance at EU28 level

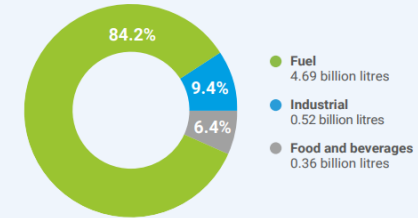


# Ethanol

- Estimated for EU28/EU27 from renewable ethanol statistics
- Industrial use assumed 75% for solvents (until 2019)
- Increase in 2020 attributed to Covid pandemic
- Numbers revised in latest ESIG inventory following updated EPURE statistics
- Until last year, these were distributed to population using an Eurostat proxy
- Given the large share of ethanol in hand sanitizer, this was changed to a population-based proxy (more realistic) – but this has caused quite significant changes in some MS

## Renewable ethanol production by end-use

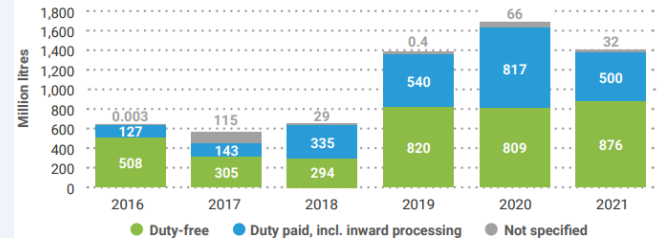
In 2021, ePURE members produced 5.58 billion litres of ethanol, operating at 87.6% of their 6.38 billion litres of installed capacity. Fuel accounted for 84.2% of the use; other markets, such as industrial applications and beverages, represented 9.4% and 6.4% respectively.



Aggregated and audited data of ePURE members. Ethanol volumes in pure alcohol

## Imports of ethanol into the EU27

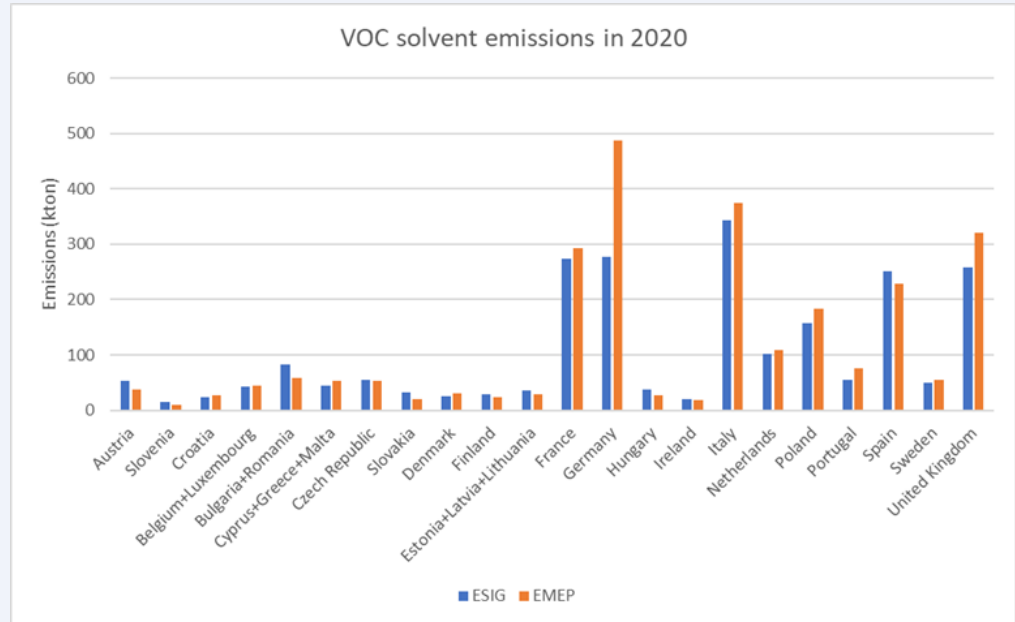
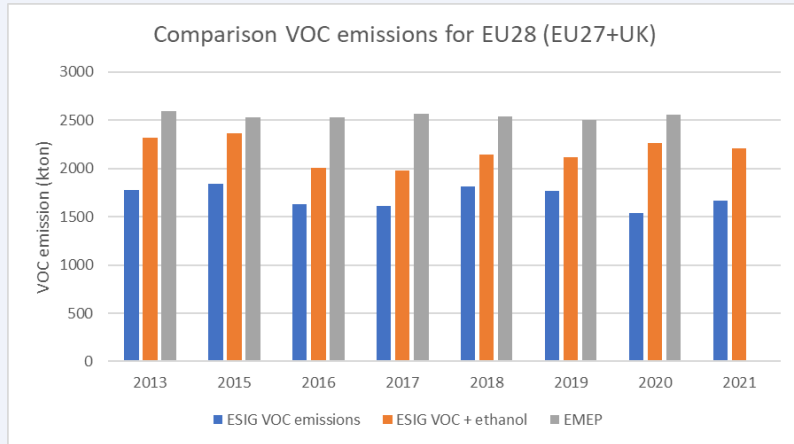
EU27 ethanol imports reached 1,408 million litres in 2021, a 17% decrease compared to 2020 with 27 Member States. Imports from countries enjoying duty-free access to the EU accounted for 62% of the imports while imports from countries without preferential access accounted for 36%. Imports from the US decreased by nearly 39% to 273 million litres in 2021 while imports from Peru increased by nearly 60% to 211 million litres in 2021. Imports of fuel ethanol into the EU monitored by EU customs represented 475 MI in 2021.



Source: Eurostat, EU28 imports until 2019, EU27 imports without the UK as of 2020

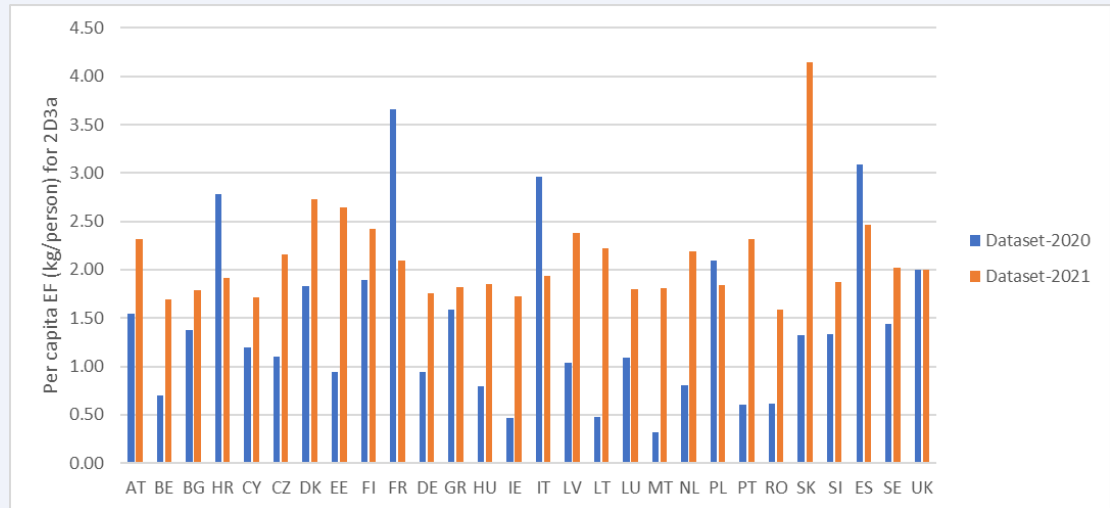
# Results

- Country specific estimates on an annual basis
- Some countries grouped together due to confidentiality rules



# Results – Comparison to previous ESG inventories

- Recalculations in last version implied quite significant changes for some countries, two particular reasons:
  - Rebalancing of import/export
  - Ethanol recalculations and redistribution over countries
- Changes at overall EU28 (EU27+UK) level only minor (1-2%)
  - For specific MS, changes up to 60-70%
- Result is a more balanced distribution, likely more realistic



# Conclusions

- ESIG VOC inventory provides estimates for VOC emissions from solvents based on actual data on solvents being put on the European market
  - But the distribution to specific EU MS is a difficult issue in the absence of real data
- Overall ESIG emissions somewhat lower than country reported emissions (for EU27/28 sum)
  - Difference is typically 10-20% but varies between countries
  - Products which are not solvents, but still cause NMVOC releases into the air
- 2021 ESIG inventories expanded the time series (2013 + annually from 2015) to better suit inventory needs
  - Significant recalculations due to methodological improvements
  - Although significant uncertainties remain due to lack of data, in particular to assess the redistribution of solvents between different EU Member States