

# THE DANISH PESTICIDE TAX

## CONTENT, FUNCTIONS, EFFECTS, TRANSFERABILITY

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# INTRODUCTION

Denmark – a 30 year-long history of taxing pesticides

Until recent redesign, not great effect

New pesticide tax appears to deliver on promises

## Outline:

- Brief introduction to Danish agriculture
- Why tax pesticides – and how
- Design of new Danish tax
- Effects of the tax
- A few concerns
- Transferability ?



# DENMARK

Pop. 5.7 million  
Area 43,000 km<sup>2</sup>  
GDP percapita : 48,400 EUR

Source: Ministry of taxation 2017 Copyright: NOAA, TV2 vejret

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- Farmland 61 pct., cereals, fodder, potatoes &..
- World Bank: 1.1 % of GDP 2017
- Export of agriculture products: 6 % of GDP
- Import of agriculture products 4 % of GDP



Copyright: Danmarks  
Naturfredningsforening

# WHY TAX PESTICIDES?

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Prices should reflect externalities caused by use of pesticides

Potential externalities

- Health
- Groundwater and drinking water
- Toxic effects on non-target species and biodiversity

Behaviour change: Higher prices offer incentive to reduce use of pesticides or switch to less harmful products

Source of revenue

# TAX DESIGN IMPORTANT

Tax bases should target pollutants or polluting behaviour

Tax rates should reflect environmental cost

But..tax rate needs to be high enough to

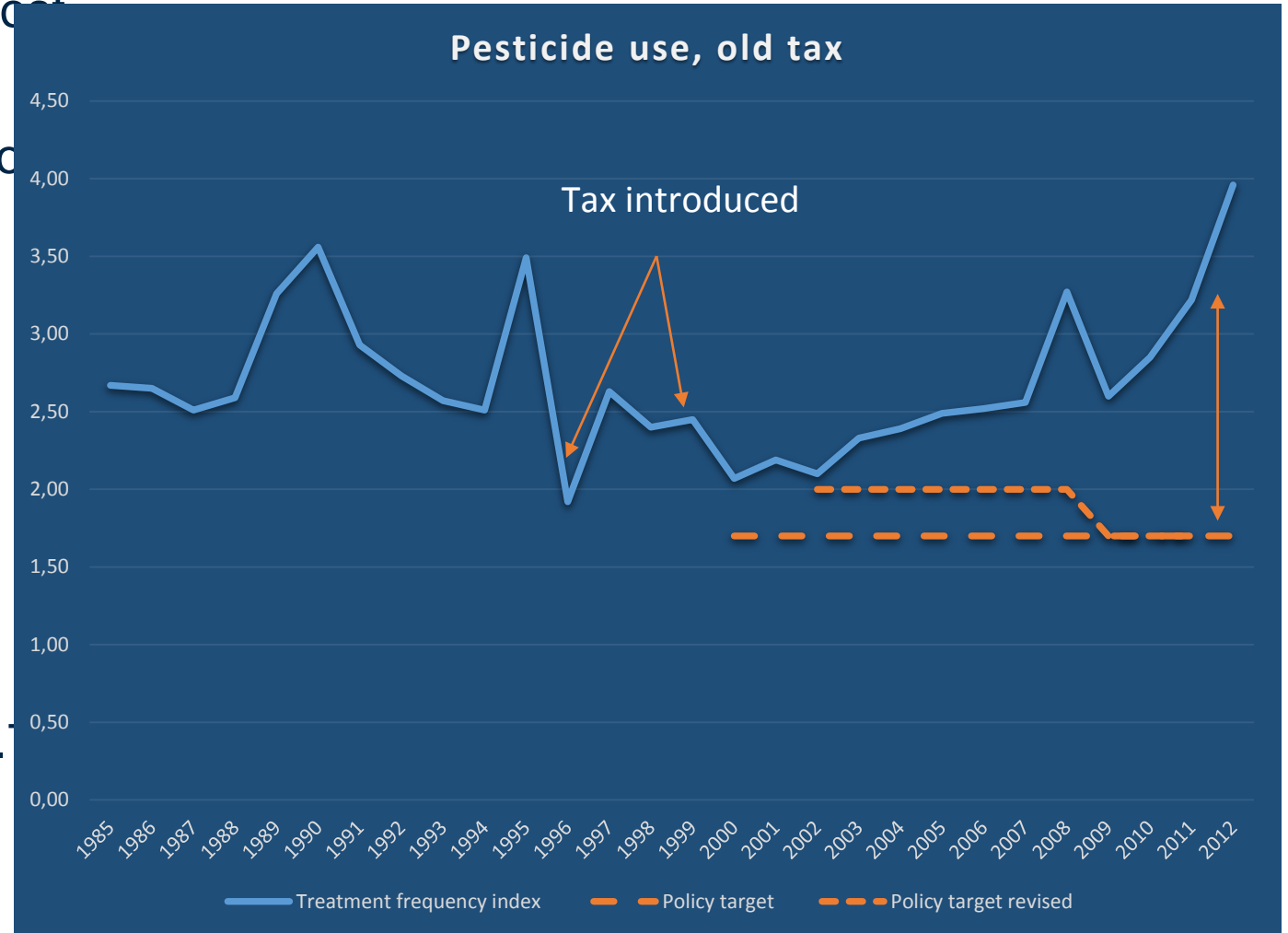
Danish pesticide tax up until 2013:

Tax base: The retail price

Tax rates: 54 pct. on insecticides,  
33 pct. on herbicides and fungicides

Objective :

50 pct. reduction/ treatment frequency1.



# PESTICIDE PLAN, 2013-2016 (CONT. 2017-2021)

Adopted in June 2012

Most important policy instrument: Revised pesticide tax.

- tax differentiated according to impact on environment and health of each product, based on a newly developed indicator (PL)
- Increase in tax rates
- Revenue returned to farmers through reduced taxes on land

Main objective : Reduction in pesticide load by 40 pct. by 2015/16 compared with 2011.  
Based on the Pesticide Load Indicator (PLI) to be reduced to 1.96

# NEW PESTICIDE TAX DESIGN

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## TAX BASES

Basic tax

Health

Environmental effect

Environmental behaviour

## TAX RATES

50 kr./kg active substance (6.5 EUR)

107 kr./kg pesticide pr. unit load index (13.9 EUR)

107 kr./kg active substance pr. unit load index

107 kr./kg active substance pr. unit load index  
(1 kr. = 0.13 EURO)

Complex calculation for each pesticide

Average tax rate increased by 125 pct.



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Revenue:  $\approx 10$  pct from basic tax and 30 pct. from each of load taxes

# EFFECTS

Sales:

40% reduction load

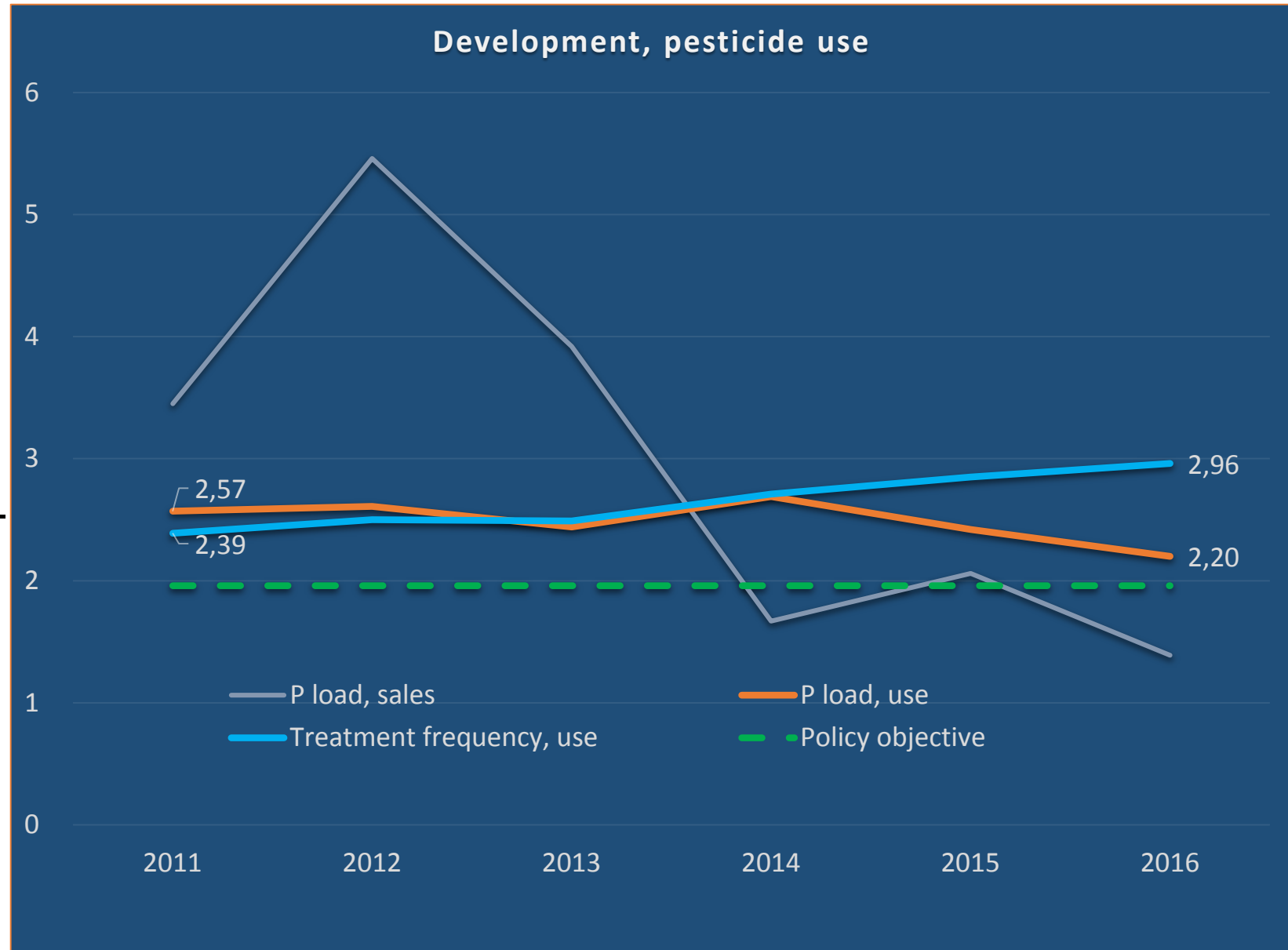
USE:

Overall use (TF) +24 pct.

Load (P load/ha) -15 pct.

I.e. substitution towards less harmful substances

Conclusion: tax appears to be working .... enough ?





# REVENUES

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Before 2013: 500M DKK (67M EUR) annually

Expected post tax:

1.1 B DKK *without behavioural effect*

650 M with a 40 pct. reduction in sales

150 M reimbursed to farmers through lower land taxes, i.e. a redistribution

Revenue, realized: about 550 mill. DKK

Revenue: before earmarked, now entered into the general coffers of Ministry

Financing supplementary efforts, including research



# POTENTIAL LABOR DABEIS

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## DISTRIBUTIONAL EFFECTS?

- High value crops – increased crop sales prices have outpaced pesticide prices
- A few crops – production area decreased due to production cost increases, but minor

## PESTICIDE RESISTENCE

Use of narrower portfolio of products? Resistance?

- Herbicides – increased resistance among grass weeds (but only few weeds)
- Fungicides – increased resistance, but not due to pesticides
- Insecticides – no change

## ILLEGAL IMPORTS?

If prices increase, the incentive to cross the border increases....'

Unconfirmed numbers: 2016 – in 2 pct. of 762 farm inspections found illegal substances never allowed in DK

(Source: The Danish Society for Nature Conservation, based on preliminary EPA reports, 2017)

# TRANSFERABILITY

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Generally, higher use of pesticides in Germany, so possibly low hanging fruits?

Broader portfolio of products, greater room for substitutions?

But issues to consider:

Tax design

- Need data and expertise to devise proper tax base
- Need tax rate high enough – political will ?
- Know your farmers: what drives their decisions and what obstacles to price adjustment
- Other policy instruments necessary, possibly financed by tax revenue

Process

- Involve stakeholders in process - provide input and increase acceptance



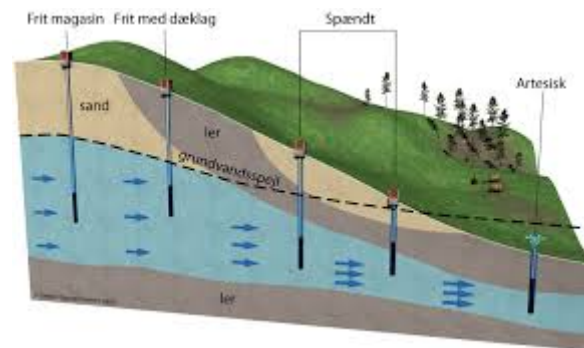
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# THE PESTICIDE LOAD INDICATOR

For all commercial products, a pesticide load (PL) is calculated and expressed as the PL per unit commercial product (kg, litre or tablet).

Three elements:

- Human health indicator
- Ecotoxicology indicator
- Environmental fate indicator



(see e.g. Kudsk et al. 2018)

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