

# Carbon nanotubes X-Ray systems for Medical Sterilization



**1 500 000 000**

2040: 19% OF POPULATION

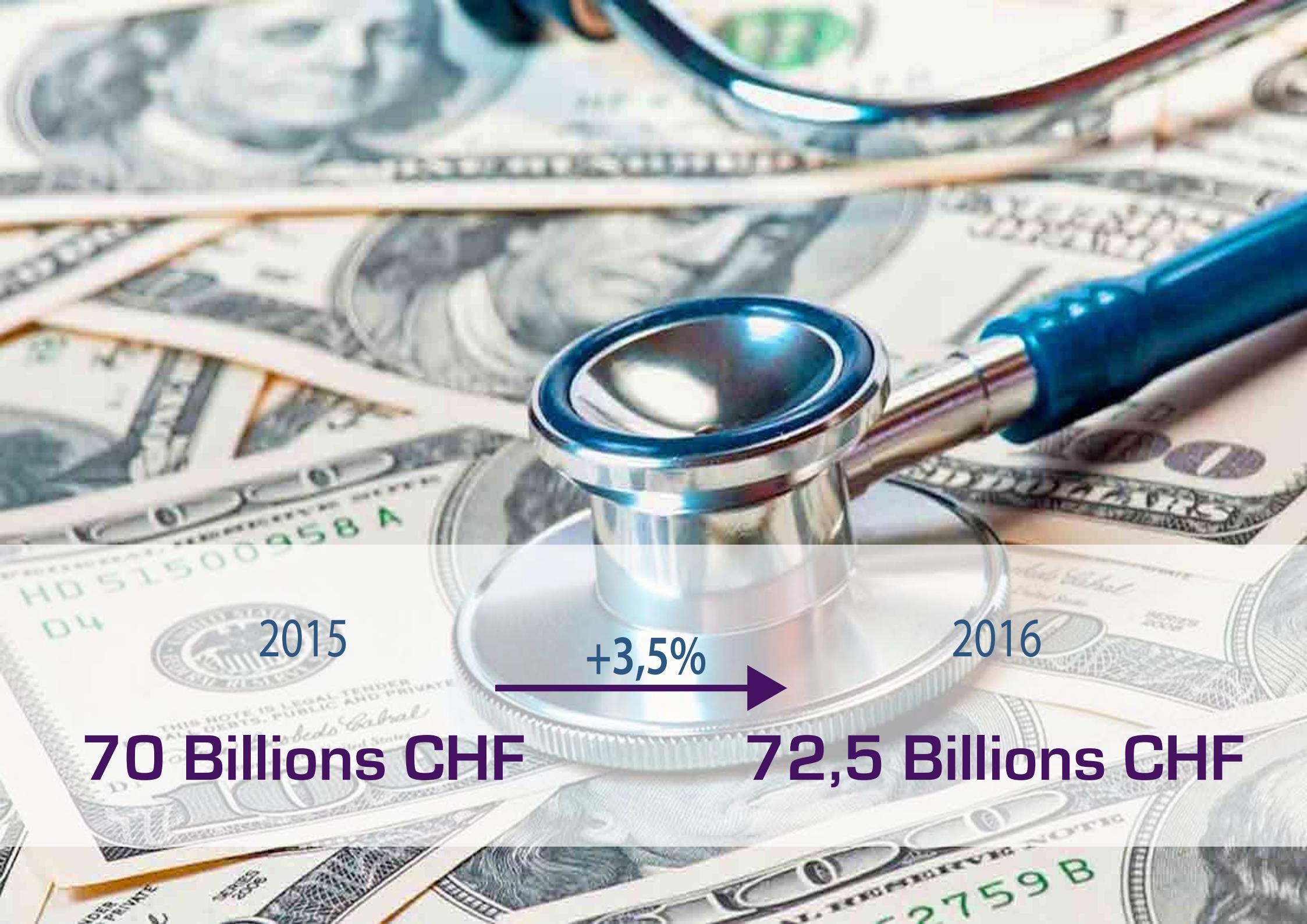
**1 025 000 000**

2025: 17% OF POPULATION

**620 000 000**

2012: 12% OF POPULATION



A close-up photograph of a silver and blue stethoscope lying across several US dollar bills. The bills are fanned out, showing various denominations and serial numbers. The background is slightly blurred.

2015

70 Billions CHF

+3,5%

2016

72,5 Billions CHF

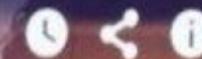
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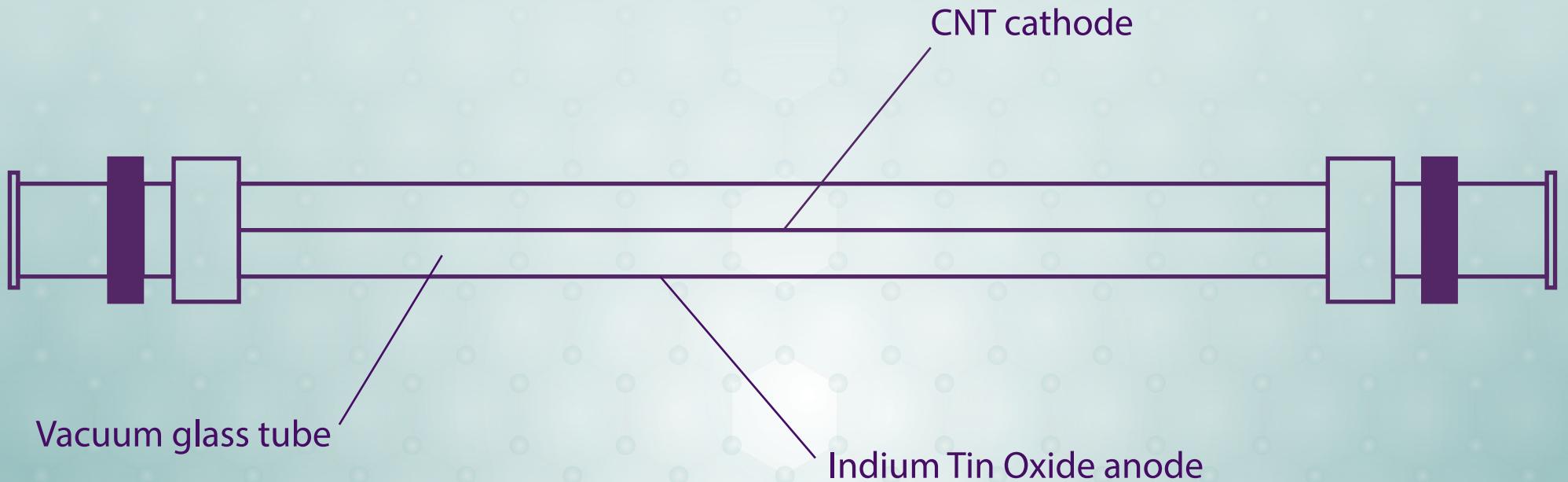
Flo Rida - GDFR ft. Sage The Gemini and Lookas [Official Video]



Raised price of life saving pill from 13,5\$ to 700\$

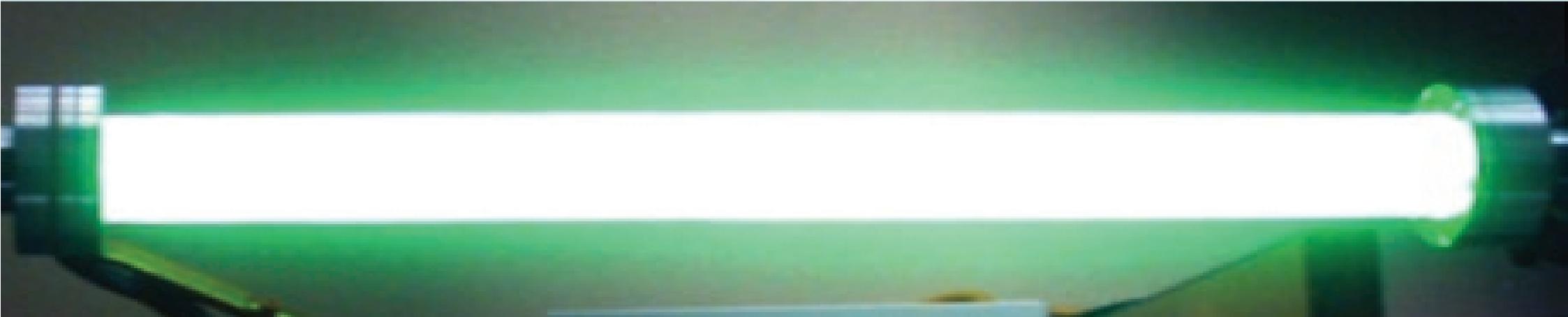


# NANO-RX



- higher longevity
- lower manufacturing costs
- miniaturisation without loss of power

# NANO-RX



- energy from 10 to 100keV
- current density up to 3A/cm<sup>2</sup>

# X-RAYS APPLICATIONS



**IMAGING**



**SECURITY**



**INSPECTION**



Medical devices sterilization is the key to reduce

**PATIENT INFECTION**

# STERILIZATION TECHNOLOGIES

Methods	Pros	Cons
Autoclave	<ul style="list-style-type: none"><li>■ Fast</li><li>■ No toxic residues</li></ul>	<ul style="list-style-type: none"><li>■ Incompatibility with thermo-sensible polymers</li></ul>
EtO	<ul style="list-style-type: none"><li>■ High compatibility</li></ul>	<ul style="list-style-type: none"><li>■ Toxic residues</li><li>■ Slow</li><li>■ Surface sterilization only</li><li>■ Third party sterilization only</li></ul>
H2O2	<ul style="list-style-type: none"><li>■ High compatibility</li><li>■ Fast</li><li>■ No toxic residues</li></ul>	<ul style="list-style-type: none"><li>■ Surface sterilization only</li></ul>
Gamma rays	<ul style="list-style-type: none"><li>■ High penetration</li><li>■ Fast</li></ul>	<ul style="list-style-type: none"><li>■ Radioactivity</li><li>■ Low compatibility</li><li>■ Third party sterilization only</li></ul>
X-Rays	<ul style="list-style-type: none"><li>■ High penetration</li><li>■ Fast</li><li>■ No toxic residues</li></ul>	<ul style="list-style-type: none"><li>■ Third party sterilization only</li></ul>

# X-RAY STERILIZATION

## Pros:

- high penetration
- fast
- clean-sustainable

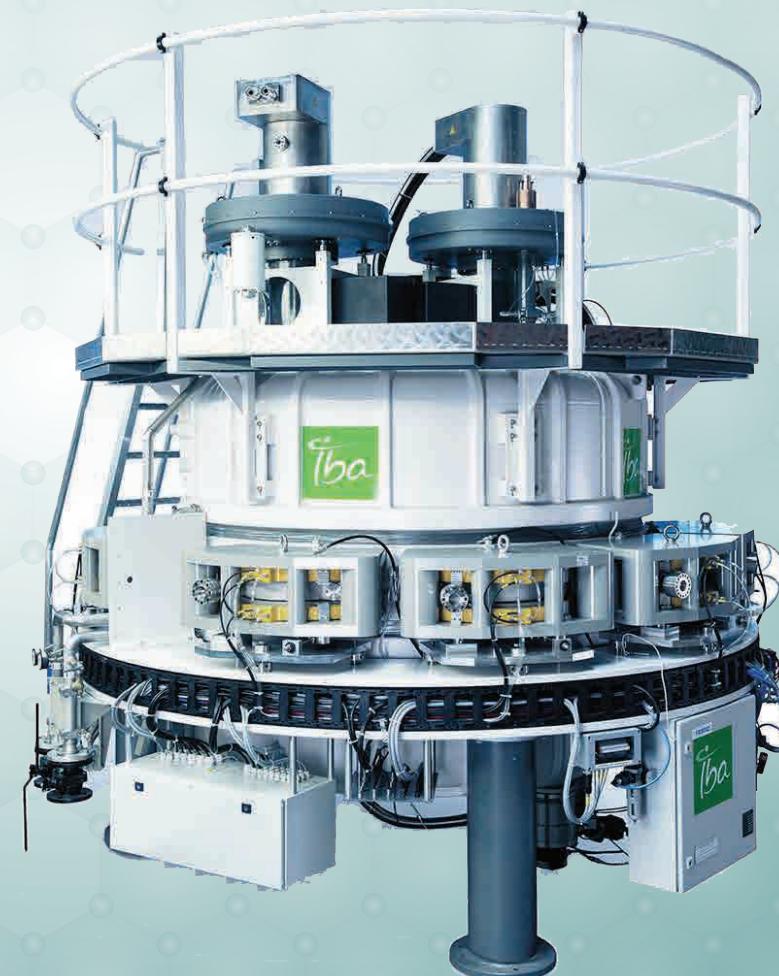
# X-RAY STERILIZATION

## Pros:

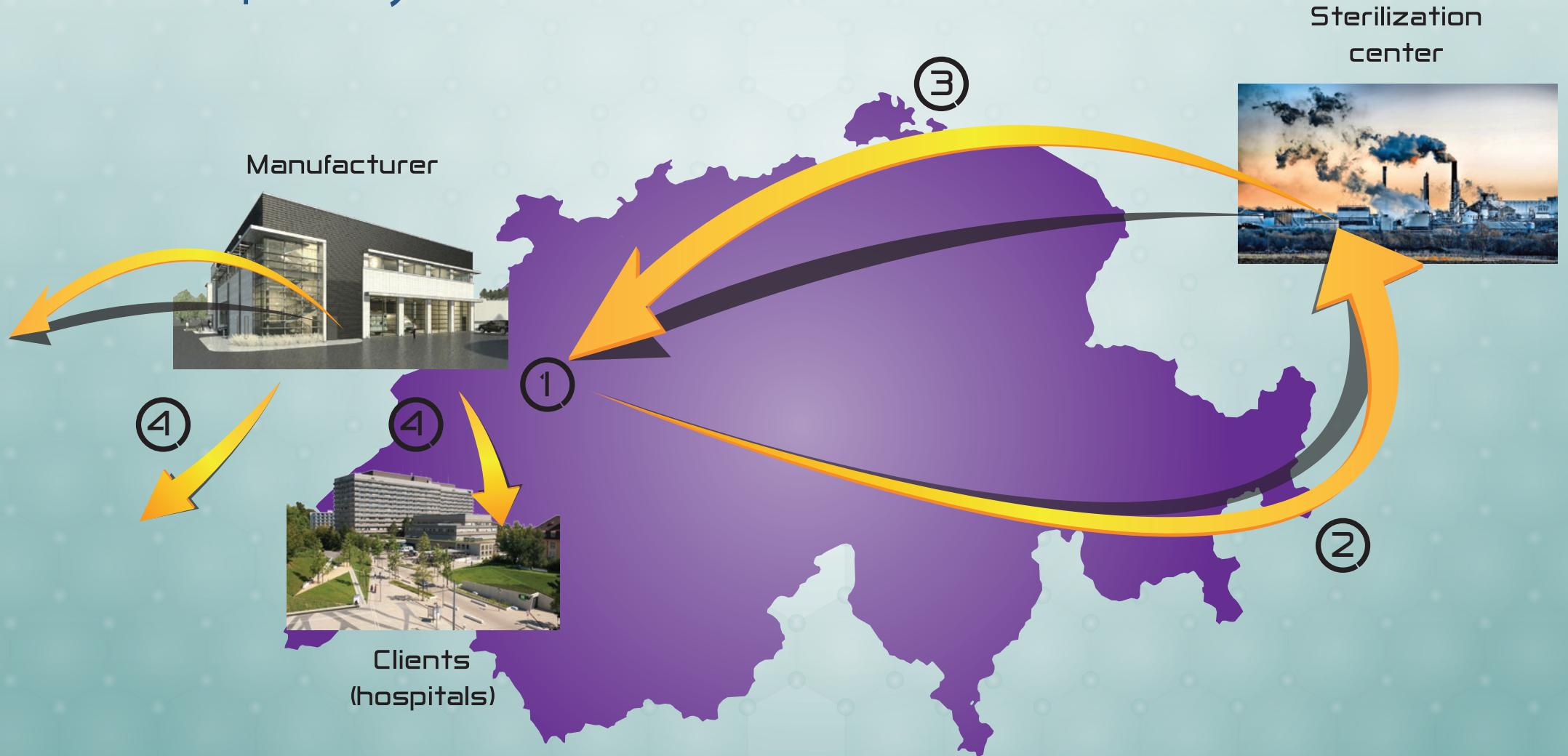
- high penetration
- fast
- clean-sustainable

## Cons:

- costs
- size of infrastructures



# Third party sterilization



Takes 2 weeks or more/batch and cost an average 180kCHF/year

# On site sterilization

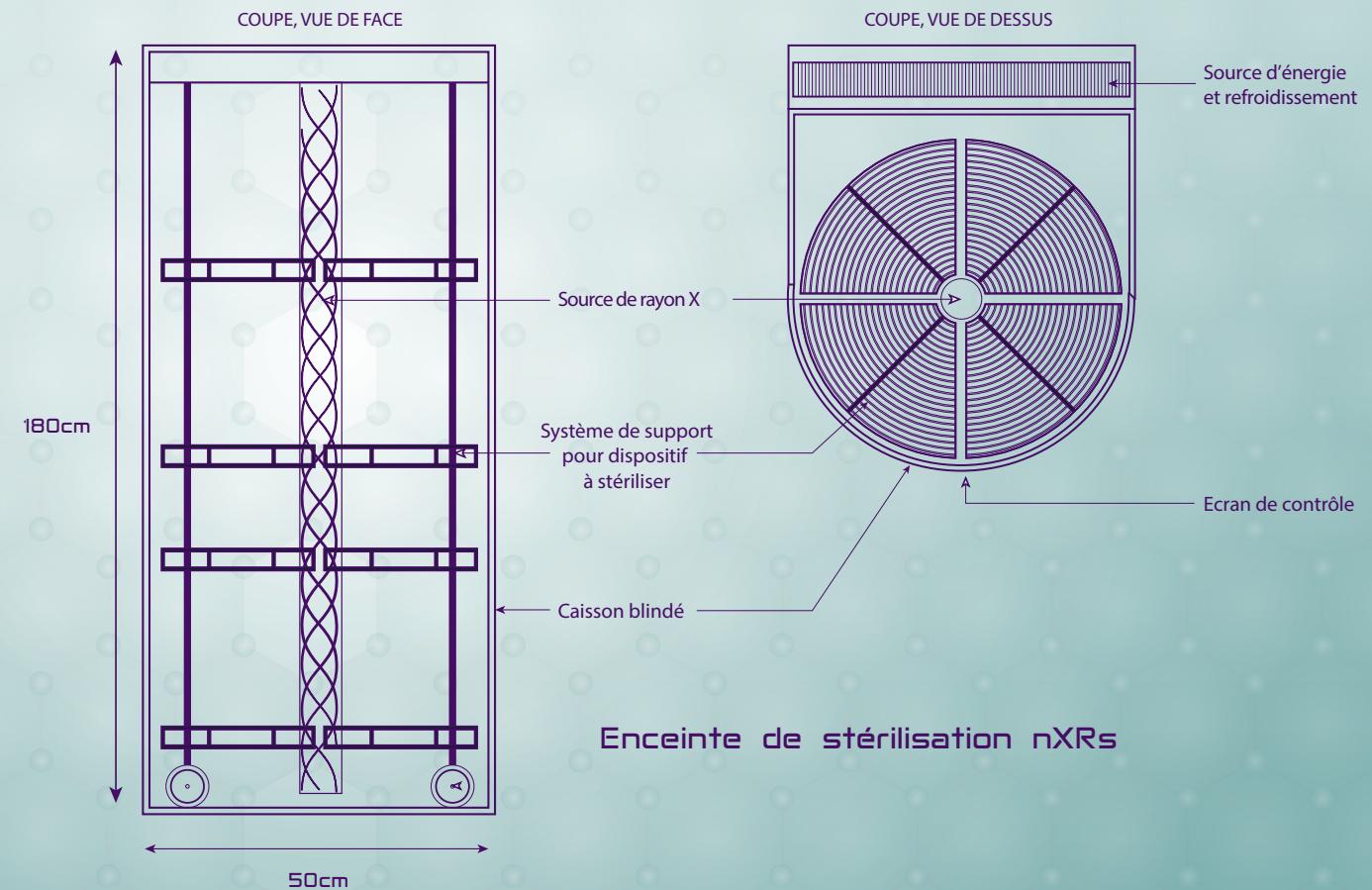


Reduction of costs and delay, better control of sterilization process

**n**  
nano

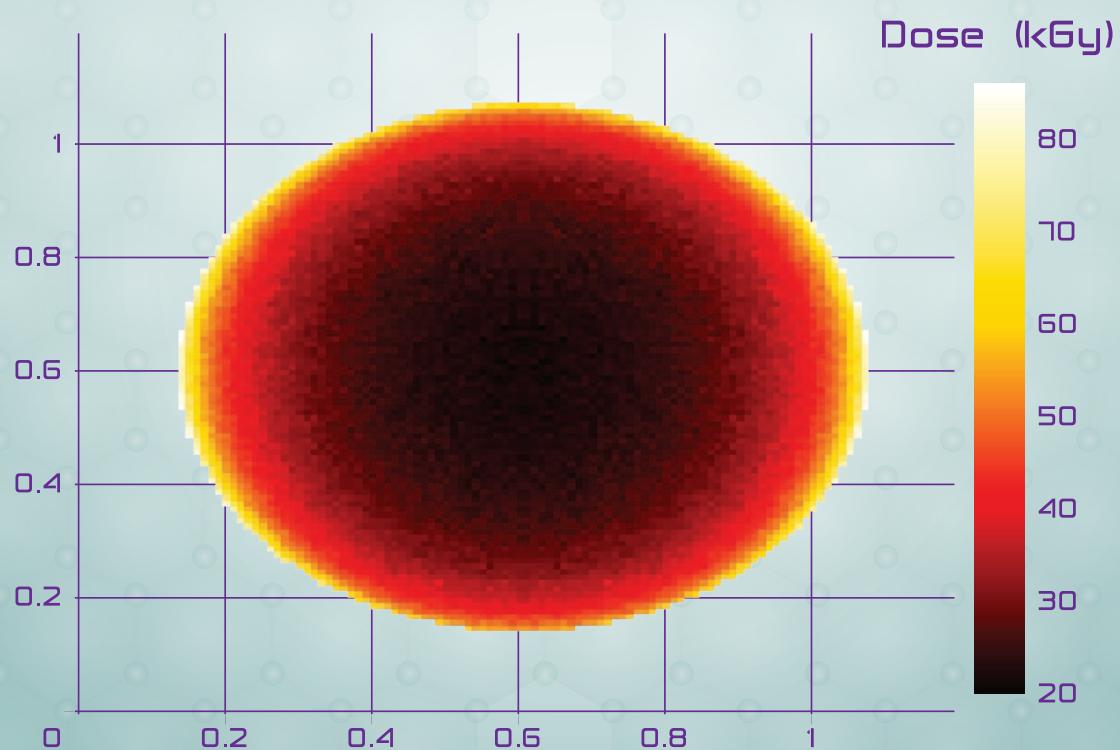
**RS**  
X-ray systems

# The RX-1 sterilization system



# MODELISATION

PVC, 100keV, 50mA, 30min



# CONTACT

