How to Rethink our Energy Policy to Transform it into a Driver of Industrial Growth in European Ports

European Sea Ports Organization

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- Major Challenges
- Industry & Ports
- Security of supply
- Recommendations

Major Challenges

- Security of energy supply :
  - From outside EU (gas, but also coal and biomass)
  - From Inside EU, due to rapidly changing production systems in a transition
- Fluctuation in energy supply induced by intermittent wind and solar energy production;
- Achieving the climate and other environmental objectives of the EU without loss of industrial production and competitiveness;
- Uncertainty for electricity producers to invest in power plants ;
- Non-integrated approach between EU member States;
- Competitive energy costs in a global business context;

Industry needs reliable energy to bring the necessary solutions for society, the environment and the climate (energy economising factor up to 70).

Targets EU energy strategy 2030

Target	by 2030
CO2 reduction	-40% (vs 1990)
Energy Efficiency	27% improvement
Renewable Energy Sources	27% market share

BUT ALSO:

Safeguarding competitivity of European industry: industrial activity should grow to 20% of GDP

Communication "For a European Industrial Renaissance" Barroso, 2014

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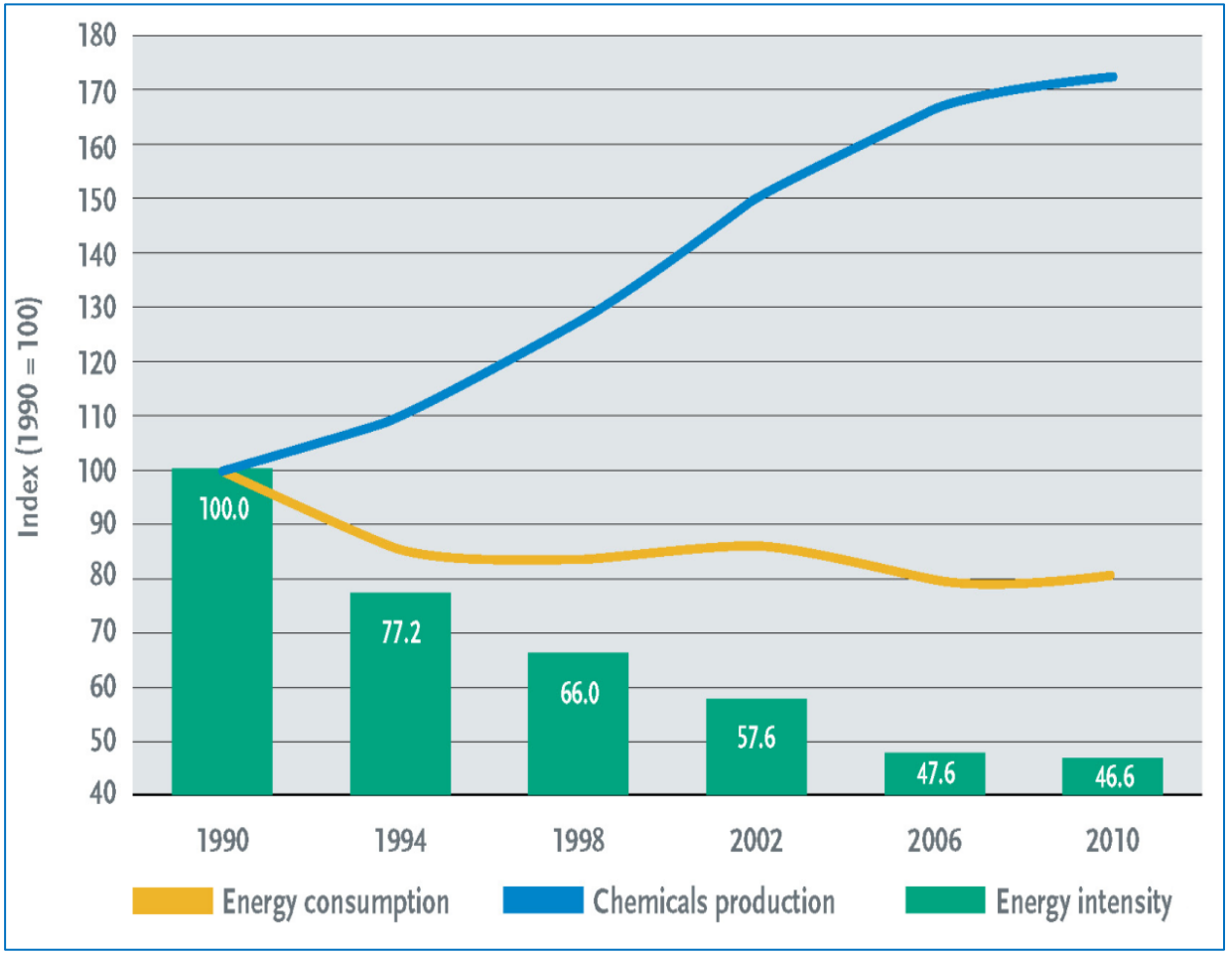
Importance of industry for ports

- Increased shipping demand
  -> improved utilisation of port infrastructure
- Increased cargo flows/ increased positioning as a logistic hub
  -> economies of scale
  -> anchor cargo for the port
- Intermodality solutions between industrial clusters
- Employment
- Social development

Industry energy track record

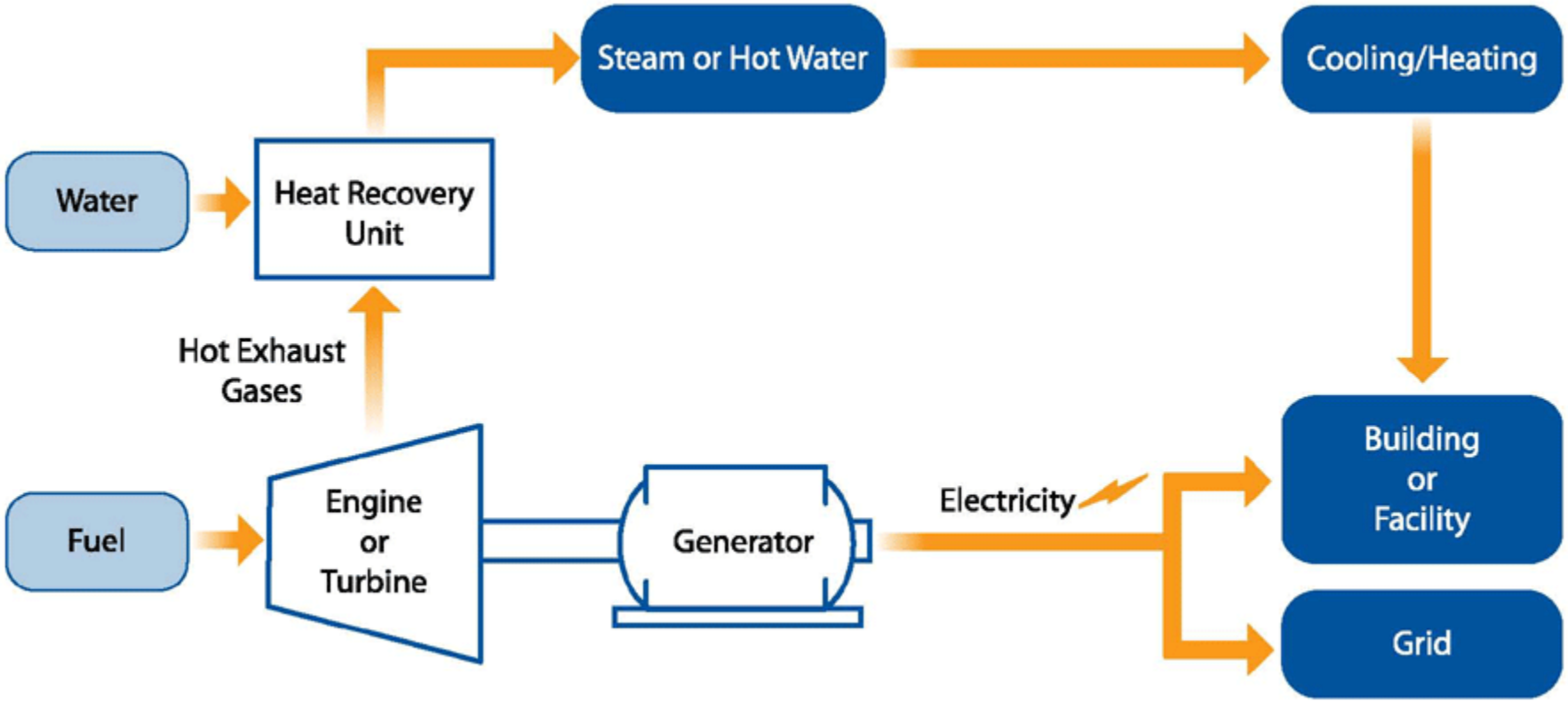


Production output increased by 70% at no expense of additional energy demand.

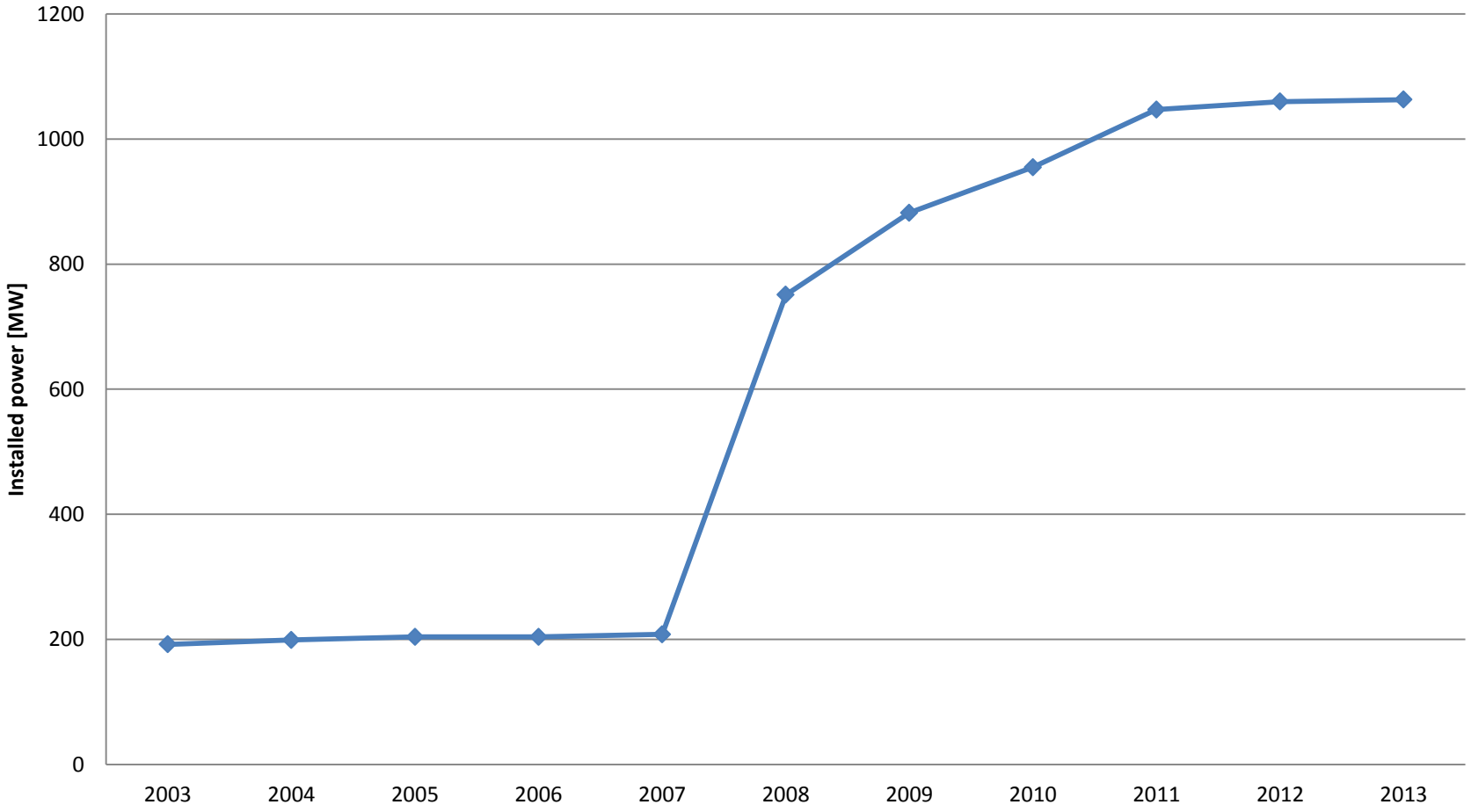
Industry Requirements from a Port (enabling function) related to energy

- Power supply security and continuity
  - CHP production facilitation (Combined Heat Power Plants)
  - Power production in or near the port
- Social and political acceptance for energy production
- Connectivity to the EU grid

Need for high energy-efficient Combined Heat Power Plants



Evolution CHP capacity Port of Antwerp



Power production in or near the port

- Combinations of production and use: maximal use of CHP's in industrial sites for optimal efficiency. Should be further supported in order to compensate the negative spark spread power to gas.

- Heat exchange in the port
  - between industrial facilities (intra- and **inter** company)
  - Coupling of processes and logistics through heat exchange

- Heat exchange opportunities externally to other activities, incl. e.g. city heating, greenhouse farming,… including provision of heat exchange networks (possible initiatives to be supported by Port Authorities)

Power production in or near the port

Windprojects

- Ports are wind prone
- Ports have unused parcels on dikes, breakwaters etc.
- Issues:
  - Bird live during migration via coast lines
  - Shadow flicker
  - Safety Risk /proximity of industrial sites and pipelines
  - less important in ports: Noise and Landscape

Solar Power

- Warehouse roofs
- Rest area, etc
- Issue: safety

Power production in or near the port

- Residual Waste incineration and Biomass power plants:

  Ports are the **best location** due to constant energy (heat and power) needs and sustainable logistic opportunities

- Logistics: dry bulk provisions (waste, local biomass and imported biomass)

- Issues:

  - Raw materials sustainability
  - Air pollution aspects (NOx, dust, etc.)

Social and political acceptance energy production

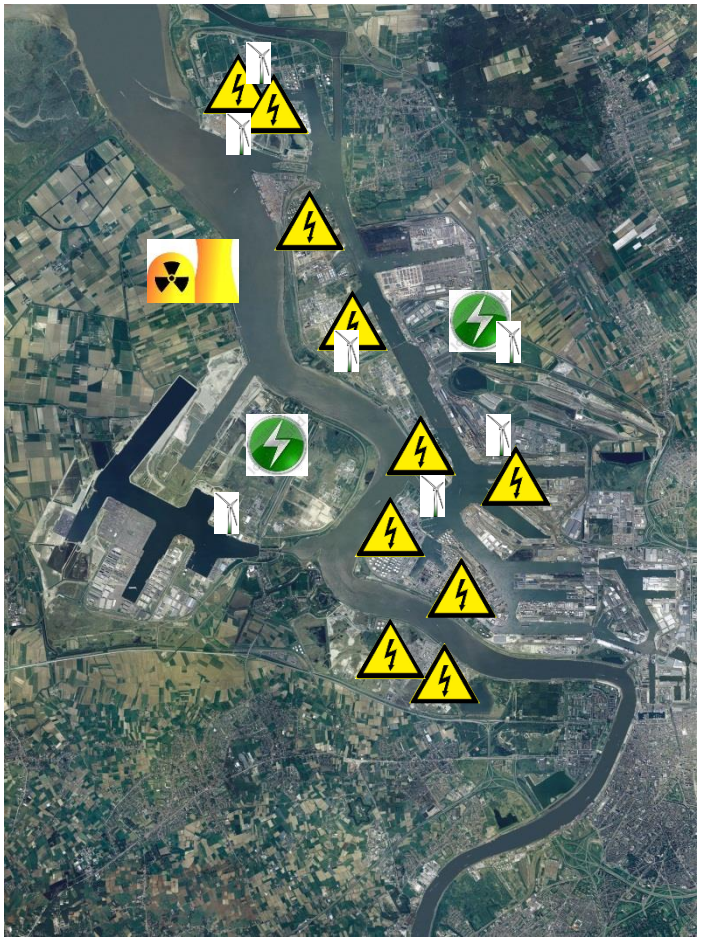
- Providing support in the context of energy efficiency:
  - Communicating /promoting practical efficiency initiatives , e.g. on a Sustainable Development Website
  - Promotion of internal and external energy-audits at the industrial sites
  - Support trajects for energy efficiency -initiatives by giving advice (e.g. to PMEs)
- Explaining to politicians and to the community the necessity of a continuous and stable energy supply for the industrial cluster to survive :
  - Economic importance for e.g. trade balance
  - Employment security
  - Basic industry as enabler of downstream activities

  One of the possibilties hereto is reporting the sustainability progress in the port to the community

Connectivity to the EU grid

- Facilitating and supporting HV-transmission lines to avoid congestion in energy provision, a necessity for an open EU-wide electricity market to function efficiently
- Issues:
  - Electromagnetic effects
  - Landscape
  - Heat removal (underground/above ground).

An example: *See also poster session*
Port of Antwerp – Key data



Elektricity Production:

- Decentralised production:
  - Quality Cogen: ~1,07 GW (18 units)
  - Wind: 45 MW
  - Solar (PV): 58 MW
  - Biomass: 42 MW (Waste)
- Centralised Production:
  - Nuclear : 2,7 GW (phase out)
- Total ~ 30% national production

Elektricity Use

~ 8.300 GWh (or 10% National Use)

An example:
The Energy Action Program of the Port of Antwerp

Step 1: focus on efficiency

- In the use of energy:
  - Clustering of heat : maximal use of waste– heat (Recognition of residual heat in the EPB scheme is important related to social suitability of waste heat projects)
  - Existing Fund for port related tools and machinery
  - The energy fund focused on energy efficient port facilities

- In balancing production and consumption:
  - flexibility – smart grids
  - energy buffering and – storage , flexibility opportunities (participating in e-harbour project)

An example:
The Energy Action Program of the Port of Antwerp

Step 2: focus on sustainable energy production

- Securing the CHP-cluster in the port of Antwerp: High gas prices – low power prices >>> Continuation of CHP installations at stake
- Accompany the Government on improving the security of supply of energy, including permitting issues
- Maximum production of wind energy in the port area
- Optimal production with Photovoltaic (PV) in the port area
- Establishment of a state-of-the-art biomass power station

Step 3: Other measures

- How to deal with CO2 (CC(U)S
- Alternative fuels (LNG, CNG, hydrogen)

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Sustainability in terms of energy

Security of energy supply

Physical

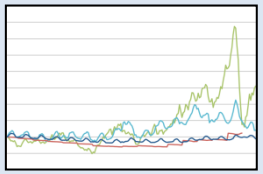
Economic

Stability

Capacity/ reserve capacity

Energy Costs

Energy Cost Evolution



Economic security of supply
Must haves

- Total cost instead of energy production prices must be the focus ! *Energy costs for the basic chemical industry can be up to 60 % of total production costs, in the port activities and logistics up to 5 %*

- **Cost reduction through minimisation of added costs to the production price of energy, particularly sensitive for internationally exposed industry**

- Level playing field related to energy costs in EU

- Authorities should be as cost effective as possible:
  - subsidy systems,
  - avoid windfall profits,
  - back-up policies for which **strategic reserve** seems to be a better tool than capacity build-up to deliver a solution to supply security in **peak demand situations**. Should **not be charged on the continuously working industry** that has a continuous demand of energy and does not cause “peak uses”, the reason to appeal to the strategic reserve.

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Recommendations

- **Energy efficiency measures are primordial , incl. CHP to minimize energy demand**
- **Generation adequacy :** assessment of the ability of the generation on the power system to match the consumption on the same (flexible) power system.
- **Production of energy** should be on the broadest possible scale**, EU –level at least,** to avoid waste of energy and unneccessary investments in production facilities.

  Integration between EU Member States: to be optimized through **integrated market** and **cross border connectivity** = necessary to harvest the benefits of the internal energy market.
- **RES as well as base load production in Ports is an opportunity and a even a necessity. This needs a stable regulatory environment and opens opportunities for PPP projects**
- **Ports can enable the necessary energy transition processes**

Recommendations

- **Total cost of energy must be in the focus** for authorities in the choice of energy systems and energy mix.
- **Avoid policy driven additive costs** especially for the **globally** exposed industrial activities
- The UN climate summit in December 2015 has to deliver an ambitious **legally-binding agreement on CO_2 reductions by committing *all* major economies**
- **Open dialogue on solutions between producers, industry, ports and community (incl. regulators/authorities)**

Ports should integrate energy in their policies.

Passion *to innovate*

needs ***Power*** *to change*

Back - Up

EU Commission Policy Communication

- Immediate actions: increasing the EU's capacity to overcome a major disruption:
  - Strengthening emergency mechanisms (solidarity between Member States);
  - Coordination of risk assessments and contingency plans;
  - Protecting strategic energy infrastructure;
- Diversifying external supplies and related infrastructure;
- Moderating energy demand;
- Increased cooperation and integrated approach:
  - Building a well-functioning and fully integrated internal EU market;
  - Improving coordination of national energy policies
- Increasing autonomous energy production in the European Union;
- Further developing energy technologies
  - Forward planning and optimisation tools;
  - Alternative resources (solar, wind, geothermic energy, etc.) ;

Key Issues to Strategic Reserves

- Before Strategic Reserve, first :
  - energy efficiency,
  - demand side management where possible (interruptibility, balancing market), grid optimalisation and interconnections (R&D support)
  - storage of energy (R&D support)
- should be as low as possible;
- stay outside the market as foreseen
- should not be charged on the continuously working industry, competing on a mondial level, that has a continuous demand of energy and does not cause “peak uses”, the reason to appeal to the strategic reserve
- Needs satisfactory interconnection if set at EU-level

Advantages of strategic reserve as method to secure power supply

1 Limited impact on energy only market

- Maintains price signals, including price volatility needed to help absorb increasing renewables volumes
- Capacity Remuneration Mechanisms (CRM) could create oversupplied and inert market with low price volatility

2 Revocable by design

- If security of supply issue is solved, strategic reserve can be abandoned
- Generation units can decide to move back into the energy only market (potentially under pre-set conditions)

3 Direct relationship between measure and size of problem

- Only covers actual costs of keeping system-needed plants online
- No windfall profits for plants that are profitable under energy only

4 Different possible financing methodologies

- Possibility to direct levy towards grid users that cause crucial peaks
- Degression rates can be used for predictable or stable users