



# Securing Europe Against Future Earthquake Losses

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## Matching earthquake risk mitigation actions to EU aims and funding mechanisms

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- **Actions to reduce earthquake risk**

- 1 - Territorial and urban planning.
- 2 - Information and preparation of the population.
- 3 - Evaluation of the seismic resistance of existing buildings and strengthening the ones with insufficient seismic resistance.
  - 3a – Strategic buildings
  - 3b – Other buildings
- 4 - Ensuring the quality of construction.
- 5 - Evaluation of the seismic resistance of lifelines and transportation networks and strengthen where necessary.
- 6 - Evaluation of the seismic resistance of industrial facilities and strengthen where necessary.
- 7 - Strengthening monuments and buildings of high cultural value.
- 8 - Civil Protection actions



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## Action 1 - Territorial and urban planning

- Implementation: urban planning instruments
- Initiative: Member-States (local, regional and national authorities)
- EU support: Research (DG RDT)  $\Rightarrow$  Identification of potential active faults and zones of possible occurrence of landslides, liquefaction and subsidence



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## Action 2 - Information and preparation of the population.

Initiative: national Civil Protection or other agencies

EU support: European Social Fund (ESF)  
(and/or DG Environment ?)

Need for extra resources : No

Need to change the regulation : No



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Action 3a - Evaluation of the seismic resistance of existing buildings and strengthening the ones with insufficient seismic resistance – Strategic buildings

Action 5 - Evaluation of the seismic resistance of lifelines and transportation networks and strengthen where necessary.

Strategic buildings – facilities of Emergency services, important facilities for running the public administration and the economy, etc.

Comment: Actions 3a and 5 are the more efficient actions to avoid economic losses.



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Action 3a and Action 5 - Vital points, lifelines and transportation networks

Initiative: Member-States

EU support: European Regional Development Fund (ERDF)

Need for allocation of extra resources in the first years: No

Need to change the regulation: No

Priorities: High and Medium seismicity zones



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Action 3b - Evaluation of the seismic resistance of existing buildings and strengthening the ones with insufficient seismic resistance – Other buildings

Comment: it is impossible to strengthen all buildings with seismic strength below current code requirements.

Criteria: to strength buildings where (i) cost of strengthening is less than expected losses, and (ii) buildings that do not possess minimum safety levels (the definition of this level is a political decision)



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## Action 3b - Other buildings

- Initiative: Member-States
- EU support: European Regional Development Fund (ERDF) or Solidarity Fund (SF)
- Need for allocation of extra resources in the first years : Yes
- Need to change the regulation : Yes
- Priority: High seismicity zones



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## Action 4 - Ensuring the quality of construction

Objective: to ensure the application of the codes and best practices

Implementation: Member-States

EU support: the EU would incentive the process by demanding guarantees from the Member-States. Ex: document by external **checker assuming the responsibility** for the quality ( including seismic strength) of the final product, and **insurance** covering seismic risk if possible.

Comments: (i) it would apply not only to the Actions for seismic risk reduction but also to new projects, and (ii) it is considered the best possible application of the **subsidiarity principle**.

Need for allocation of extra resources: No

Need to change the regulations: Yes (ERDF and Cohesion Fund, CF)



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Action 6 Evaluation of the seismic resistance of industrial facilities and strengthen where necessary.

Initiative: Member-States

EU support: European Regional Development Fund (ERDF)

Need for allocation of extra resources in the first years : unknown – to be evaluated after better characterization of the situation

Need to change the regulation : No

Priorities: High and Medium seismicity zones



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## Action 7 - Strengthening monuments and buildings of high cultural value

Initiative: Member-States

EU support: European Regional Development Fund (ERDF)

Need for allocation of extra resources in the first years : unknown – to be evaluated after better characterization of the situation

Priorities: High and Medium seismicity zones



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## Action 8 - Civil Protection actions.

Initiative: Member-States and DG ENV (tsunami warning centres and planning coordination activities with support of national Civil Protection agencies)

EU support: DG ENV and European Social Fund (training and formation of personnel, campaigns for public awareness)

No large increases of resources are foreseen



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Action	Fund	Need for change in the Regulation	Need to increase the resources of the Fund
2	ESF	No	No
3a	ERDF	No	No
3b	ERDF	Yes	Yes
4	ERDF+ CF	Yes	No
5	ERDF	No	No
6	ERDF	No	?
7	ERDF	No	



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## PRIORITIES

The definition of criteria for the allocation of resources is necessary. The following criteria should be considered:

- hazard levels
- cost-benefit analysis
- potential for life saving
- dimension of a potential catastrophe to be avoided as compared to the capacity of the respective Member-State to recover from it

It is proposed to consider 4 hazard levels: High, Medium, Low and Very Low seismicity zones. The distinction can be made in terms of the peak ground acceleration embodied in the codes in force in each region.



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## Research

It is not an explicit Action but a fundamental instrument of support of most actions necessary to reduce earthquake risk.

The main competitors of Europe, the USA and Japan, invest much larger resources in research and seismic protection



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## Political background

European integration  $\Rightarrow$  pooling national sovereignty in favour of EU institutions  $\Rightarrow$  creates an european dimension in many issues

Example: 2002 floods in central Europe  $\Rightarrow$  the German Chancellor stated that “he was expecting help from Brussels, since the dimension of the catastrophe was beyond the limits of national intervention”  $\Rightarrow$  Solidarity Fund

EU policy  $\Rightarrow$  promotion of sustainable development  $\Rightarrow$  seismic protection is indispensable

Japan, USA and New Zealand are ahead of Europe in seismic protection  $\Rightarrow$  much better basis for sustainable development



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Most of the proposed Actions should be of the initiative of the Member-States. However EU institutions can:

- 1 - Promote coordination of national Civil Protection agencies at European scale for action after large catastrophes
- 2 – Promote the development of technical legislation for seismic protection: continued development of EC8 and identification and elimination of gaps in the existing technical legislation (lifelines, seismic design of mechanical and electrical equipment, etc.)
- 3 – Create tsunami warning centres for the Atlantic and the Mediterranean
- 4 – Increase resources for research in earthquake engineering and seismology



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- 5 – Issue Recommendations or Directives for the Member States to enforce the assessment and seismic upgrading of strategic buildings and facilities with EU support
- 6 – Change the regulation of the ERDF to allow incentives for the seismic upgrading (or substitution) of the most vulnerable buildings (most of the expenses would be supported by the Member States and private sector)
- 7 – Require from the Member States the enforcement of procedures to guarantee the quality (including seismic resistance) of all works supported with EU Funds
- 8 – Bring the issue of protection from natural catastrophes (to ensure sustainable development and security of people) to the European public agenda.



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More informations:

<http://www.civil.ist.utl.pt/~mlopes/conteudos/EP/>