

## PILOT PROJECT PROPOSAL

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## Background

- This is the next R&D phase of the ESA initiative for the study of a space weather programme.
- The feasibility study has shown:
  - Strong European assets and capabilities (observatory infrastructure, science).
  - Logic and feasibility of a programme exists.
  - Benefits and markets are spread over several disconnected domains (no major user).
  - European SW data are under-used in Europe (cf NOAA).
  - Uncertainty of value of benefits and way to assess it



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## Objectives

- Develop the user community of space weather data in Europe.
- Federate existing and develop new activities in a common network and develop a software infrastructure for it.
- Encourage synergy between various users and service providers and across domains.
- Get detailed data on cost, impact of effects, cost of services and value (economic, strategic, ...) of services.
- Assess user requirements for future development and identify technology requirements (esp. space based measurements).
- Assess space segment (Phase A)- **Not yet.**



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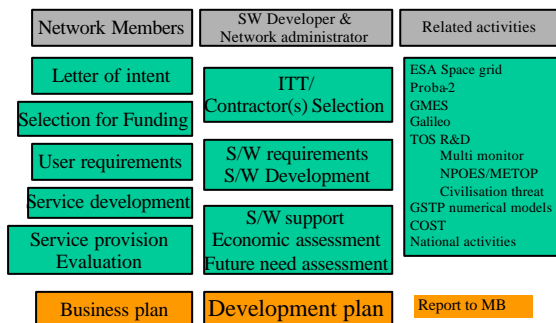
## Proposed Approach

- Create a network of R&D activities for space weather applications – with close link to users (// COST).
- Several small contracts to pairs of user-service provider in co-funding (up to 15 for up to 100 kEuro each).
- Commit to be part of the co-ordinated network (non funded pairs are accepted as well).
- Attend user/service meetings (in conjunction with COST).
- Provide requirements for common SW architecture.
- Provide part of their service as public in the common architecture.
- Provide inputs to cost-benefit analysis
- Provide inputs to analysis of requirements to future system.



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## Study Structure



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## Priority – Selection – Co-funding

- Existing service entity?
- Possible new?
- Priority items?



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### Current Member States SW Service Providers (Preliminary non-exhaustive list to be completed to appear on swwt www)

1. BGS, UK (Ap and F10.7 prediction)
2. CLRC, UK (real-time TEC maps)
3. CLS, France (F10.7 prediction)
4. DASOP, France (Solar cycle prediction)
5. DMI, Denmark (Dst forecast, FAC model, near real-time Polar Cap index)
6. EGNOS, International (realtime signal integrity)
7. FMI, Finland (GIC and Aurora monitoring)
8. IRF-Lund, Sweden (Aurora , Dst, AE, Kp S/C-anomaly forecast, warnings)
9. SIDC, Belgium (Sunspot numbers K,A; F10.7 daily pred.; flare pred./warn)
10. SIEVERT, France (real time radiation monitor data)
11. TOS-EMA, ESA (Real time dose curve derived from NOAA/SEC).
12. TOS-GMA, ESA (Drag prediction)
13. [<IAP, Germany (support to German army on communications)>]



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### Others with SW effects expertise

(Potentially new service providers –  
preliminary list to be completed and example targets for AO)

1. BAS, UK
2. BIRA, B
3. CNES-CST, F
4. DIAS, Irl
5. DLR, G
6. IRF-K, SE
7. MSSL, UK
8. NPL, UK
9. ONERA/DESP, F
10. QinetiQ, UK
11. BASS2000, F
12. ....?



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### Potential (Priority?) Item

- SPE warning system for launchers
- Induced current warning systems for pipelines, railways and power grids
- Magnetic storm warning for prospecting
- Orbital drag prediction for LEO s/c and objects
- Scientific instruments interference
- Aircrew and passenger radiation monitoring and exposure warning
- Manned space mission radiation monitoring and prediction
- Spacecraft anomaly monitoring and prediction
- Optical aurora prediction for general public & tourism
- Real-time ionospheric TEC for positioning systems
- Ionospheric prediction for ground & space based communications, radars and positioning
- Solar, geomagnetic, ionospheric predictions for support of scientific investigation planning



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### Proposed Schedule

- |                          |             |
|--------------------------|-------------|
| • Task force:            | 13-03-2002  |
| • MB                     | 8 /4        |
| • SWWT                   | 10/4        |
| • Information Letter     | 15/4        |
| • AO                     | 10/5-30/6   |
| • Notification of result | 14/7        |
| • ITT                    | 30/7        |
| • Close                  | 30/9        |
| • Tender Evaluation      | 30/9-15/10  |
| • Negotiation Phase      | 15/10-31/10 |
| • KO                     | 7/11        |



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### Proposed COST Breakdown

- S/W Infrastructure dev and support and Network Management and Assessment Study: 300-400 kEuro .
- Service items development: up to 15 up to 100 kEuro each (in co-funding).
- Economic assessment 100-200 kEuro .



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### Remaining Issues

- Real-time data
- Grouping/competition of pairs;
- Importance of R&D (tools, models, data assim.) in service projects;
- Small number vs large number;
- Co-ordination with other activities;
- Acceptance of funding;
- ESA participation as service provider;
- Manpower for many activities supervision;
- Review of proposal and selection procedure.
- Confidentiality.
- Independent economic assessment.
- Schedule incompatibilities with co-funding
- Phase A?
- Co-funding (internal? industry? International?,...).



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