



Organisation & Governance Study

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Aims of the Study

As there is a:

- move away from just “best efforts” services
- move to effective/reliable delivery of end to end services across multiple domains
- move towards automatic end user provisioning of end to end services

Effective Organisation & Governance becomes more important!



Aims of the Study

- The funding and charging models and funding levels used by the different organisations in the chain of delivery of network services
- The level of autonomy that the various individual network organisations (NREN organisations, regional network operators, universities, colleges and research institutions) wish to maintain in deciding on the standards that they will adopt and the methods used to implement and support their network services.
- The variability of network support and service availability in different network domains.
- The variability of network performance in different network domains and the methods by which performance issues can be and are addressed.



Aims of the Study

- The variability of the policies in situ for the provisioning of services that can support end-to-end services. E.g. VPN
- The differing attitudes of NREN organisations and user groups to the self-provisioning of networking, not following current models. E.g. use of cross border fibre
- The way in which NREN organisations support projects that need "special" facilities or arrangements when projects are:
 - Within their own NREN domain
 - Span multiple NRENs
- The arrangements that NREN organisations have for communicating with their user base, particularly with those users that may require specialised services, some of which may rely on guaranteed end-to-end services.



Questionnaire

- Sent out to 45 NRENs or emerging NRENs
- Responses received from 33
 - Responses very variable
 - Not all questions answered
 - Good sample of different NRENs
 - small & large
 - from different parts of Europe & beyond



Key Questions for you!

- Do you agree with the recommendations made?
- If not what would you like to change based on the evidence?
- Would you like to add recommendations based on the evidence from the questionnaire?
- Which recommendations are the most important ones that should be highlighted in the summary report?



Questionnaire Results - budgets

Type of funding of NRENs and budget setting

Type of Funding	Number	Multi-annual budget	Annual budget	No response
Central government grant	6	1	5	0
Mixed (including government grant and users)	18	5	13	0
Mainly user funded	2	0	2	0
Government + EU	5	3	2	0
Not stated	2	0	1	1
Total	33	9	23	1
Total percentage	100%	27%	70%	3%



Questionnaire Results - budgets

Budget setting of NRENs

Type of budget setting	Number	%
Set a multi-annual budget	2	6%
Predict a multi-annual budget	5	15%
Set a multi-annual budget and change it if required	7	21%
Only set an annual budget	18	55%
No response	1	3%
Total	33	100%



Questionnaire Results - budgets

Budget look-ahead for NRENs who predict or set multi-annual budgets

No of years ahead budget is predicted or set	No of NRENs
2	3
3	5
4	3
5 years or more	3



Questionnaire Results - budgets

Carrying forward of NREN budgets

Carry forward of budget at year end	Number	% of NRENs
Allowed to redeploy the budget and use for something else	7	21%
Have to return the budget to the organisation providing the funding	5	15%
Allowed to carry forward to next financial year without permission	14	42%
Make a justification to carry forward budget for particular items	9	27%
Get permission from the funding organisation to carry forward	8	24%



Questionnaire Recommendations

Recommendations for NRENs

1. If one wants NRENs to develop in a cost effective and efficient way, then the ability of NRENs to plan ahead is very important. Many NRENs are only setting annual budgets. It is recommended that all NRENs set multi-annual budgets covering at least a period of three years, even if their funding organisations do not guarantee a budget over this period.
2. If NRENs are not provided with multi-annual guarantees of funding, they should enter a dialogue with their funding organisations in an attempt to improve the budget planning and commitment process, so that longer-term (multi-annual) budgets can be agreed and set.



Questionnaire Recommendations

Recommendations for NREN funding bodies

1. If one wants NRENs to develop in a cost effective and efficient way, then the ability of NRENs to plan ahead is very important. Many NRENs are only setting annual budgets, probably because the funding is not guaranteed over a period longer than one year. It would be helpful if there is a longer-term commitment to providing a stable budget, subject to other constraints, so that the budget horizon for NRENs can be extended.
2. Some NRENs are not allowed to carry forward budgets from one financial year to the next. This will cause budgetary problems with longer-term projects that get delayed or have to be re-profiled. It should be considered to allow all NRENs to carry forward their budgets from one financial year to the next. This could be done by requiring justification for carrying forward budgets, based on a business plan. The process to decide about giving permission for carrying forward budgets needs to be streamlined, so that the decision can be made in a reasonable time period.



Questionnaire Results technical support for special projects

Technical support for special projects in the NREN	Number	% of NRENS
A project team with NREN staff and the user community staff is set up to manage the project	16	48%
Informal dialogue with the user community staff takes place.	16	48%
Other arrangements are put in place	6	18%

Technical support for special projects across multiple NRENS	Number	% of NRENS
A project team with NREN staff and the user community staff is set up to manage the project	8	24%
Informal dialogue with the user community staff takes place.	6	18%
Other arrangements are put in place	12	36%



Questionnaire Results

Recommendations for NRENs

3. NRENs are recommended to develop project and/or business plans for new projects or enhanced services, particularly when seeking additional funding.



Questionnaire Results – institution charging

Institution charging models	Number	% of NRENs responding
Bandwidth of interface to institution	5	25%
Bandwidth consumed/usage	3	15%
Size of institution + bandwidth consumed/usage	2	10%
Type of institution + bandwidth of interface	2	10%
Type of institution + bandwidth consumed/usage	1	5%
Size and type of institution + bandwidth consumed/usage	1	5%
Size and type of institution + interface bandwidth	1	5%
Size of institution + bandwidth consumed/usage+ interface b/w	1	5%
Linear cost sharing	1	5%
Other	1	5%
None	2	10%
No response	13	39%
Total responding	20	61%



Questionnaire Results

4. Where possible NRENs should aim to simplify user institution charging models, whilst maintaining transparency and fairness of charging. E.g. If bandwidth used is measured this takes up resources to measure the bandwidth, report on it and then bill institutions based on the bandwidth used. Simpler models would be ones with just one or two parameters that were linked to the type of institution or the type/bandwidth of the interface or bandwidth limit configured on the interface connecting the institution.



Questionnaire Results - support for wavelengths

- 97% responded
- 6 (19%) support wavelengths to end user sites
- 14 (44%) plan in the future to support wavelengths to end user sites
- 12 (38%) have no plans to support wavelengths to end users sites.

Recommendation for NRENS

6. NRENS that have not already done so, must look into the future possibility of providing wavelengths to the sites of end-user institutions, in order to support future collaborative research projects that require wavelengths. Charging mechanisms for the provision of wavelengths should also be put in place, so that research groups can budget appropriately when writing research proposals and costing research projects. Where wavelengths cannot be provided suitable alternative arrangements should be investigated and appropriate alternative solutions put in place when required.



Questionnaire Results

Future funding for GÉANT

a) Like now through 50% DG-INFISO

d) Through 50% E.C. Infrastructure funding

19 (73%) a + 3 (12%) d

+ 3 (12%) (a+d)

1 suggestion that dependency on E.C. funding should be reduced



Study Recommendation

Recommendation for the European Commission.

The European Commission should continue to provide funding for GÉANT and provide further support for the development of policies for the development of end-to-end services.



Questionnaire Results

NREN Governance structures

- 66% are legal entities or part of a larger legal entity
- 62% of NRENs are controlled by a committee of stakeholders, who could be government representatives and/or representatives from the research and education communities.
- 35% of NRENs are part of a government department or are controlled by a government department.
- Only 6% of NRENs have a “normal” company structure where the NREN company is controlled solely by its senior officers such as directors.



Questionnaire Results- user representation in governance

Type of institution	Number of NRENs in which represented	Percentage of NRENs in which represented	Number of NRENs in which not represented	Percentage of NRENs in which not represented	Number of NRENs from which do not receive service	Percentage of NRENs from which do not receive service
Universities	27	82%	6	18%	0	0%
Research institutions	20	61%	11	33%	2	6%
Tertiary/professional institutions	9	27%	11	33%	12	36%
Primary/secondary schools	5	15%	13	39%	14	42%
Government depts	13	39%	9	27%	11	33%
Health service / hospitals	5	15%	11	33%	17	52%
Commercial with links to R&E	0	0%	9	27%	24	73%
Commercial with no links to R&E	0	0%	3	9%	30	91%
Other organisations	2	6%	4	12%	27	82%



Questionnaire Recommendations

Recommendations for NRENs

5. The study has commissioned from a limited number of NRENs a description of how these NRENs are organised and governed. These documents are useful reference documents. It would be very helpful to organisations that deal with NRENs to have such descriptions available for all NRENs, in order to provide an understanding of the structures and decision making bodies of the NRENs. All NRENs are recommended to develop such reference documents.

7. NRENs that do not have representation of key stakeholders in their governance structures should consider including these stakeholders in their governance structures, allowing all key stakeholders to have an input into the decision and policy making processes of the NREN.



Questionnaire Results – policy development

Policy development and agreement method	Number	% of NRENs that responded
Developed and agreed by NREN organisation management team	13	39%
Developed and agreed by the NREN organisation management team and the management committee of the NREN's organisation legal entity e.g. the "board" of the legal entity.	10	30%
Developed by NREN management team and the management committee of the NREN's organisation legal entity and agreed by a committee representing universities and research institutions	10	30%
Developed and agreed by a committee representing universities and research institutions	2	6%
Developed and agreed by the government department of education or research	2	6%
None of the above	2	6%
Total	39	118%



Questionnaire Results – technical policy development

Technical policy development and agreement method	Number	% of NRENs that responded
Developed and agreed by NREN management team	22	67%
Developed by NREN management team and agreed by a committee representing universities and research institutions	10	30%
Developed and agreed by a committee representing universities and research institutions	1	3%
Developed and agreed by the government department of education or research	0	0%
Developed and agreed by network operator	1	3%
Developed by working groups with NREN and university representatives	1	3%
Developed by other methods	1	3%
Total responses	36	109%



Questionnaire Results

8. NRENs should consider consulting with existing stakeholders when taking very important strategic decisions, such as who should be allowed to connect to the national research and education network.

5 NRENs had concerns about decision times by the bodies responsible

9. NRENs whose plans get delayed by too lengthy consultation and/or decision making processes should seek to improve their circumstances, either by planning further ahead or by attempting to streamline the necessary consultation and/or decision making processes.



Questionnaire Results

SLAs

- 18% (6) of NRENs deliver services in line with an agreed SLA
- 73% (24) of NRENs that had no formal SLA but delivered services to “best efforts”
- 9% (3) NRENs had no defined service levels at all.

Recommendation for NRENs

10. NRENs should consider developing Service Level Definitions or Service Level Agreements in line with best practice.



Recommendations for NRENs

User self provisioning of services

- 58% NRENs have no plans for end-user provisioning of VPNs
 - 70% of NRENs have no plans for end user provisioning of QoS services.
11. NRENs should work together to develop robust self-provisioning of end-to-end services, assisted by the co-ordination efforts of TERENA and DANTE. This will allow supporting in a better way collaborative research and education activities that use applications requiring end-to-end quality of service and/or high bandwidth.
 12. NRENs that pay for the development of additional networking infrastructure or services for special research and education projects need to maintain close contacts with the research and education community so that they can plan together the necessary budgets.



Recommendations for NREN funding bodies

3. Funding bodies need to be aware that certain projects may need the development of additional networking infrastructure to support collaborative research or education. This needs to be budgeted either in the budget of the research or education project or in the NREN's budget, depending on the funding models used.
4. Funding bodies may need to provide help, or where applicable give permission, to NRENs to modify their governance structures in order to improve stakeholder representation on NREN governing boards.



Study recommendations

Recommendations for the R & E communities

1. Researchers who develop research proposals that require the provision of high bandwidth or, even more importantly, dedicated wavelengths to end-user sites must liaise with the NRENs concerned to ensure that the costs of the provision of the networking infrastructure is taken into account in the budget of the research project.
2. Rather than developing plans for implementing dedicated network infrastructures in isolation from NRENs, researchers should consult with NRENs and aim to use NREN network infrastructures whenever it is possible and cost effective to do so.
3. The research community needs to work with NRENs on developing and testing self-provisioning of end-to-end services, so that research and education collaboration can be better supported using applications that require end-to-end quality of service and/or high bandwidth.



Governance Models

The requirements for a suitable NREN governance model are:

- Accountability to the organisations financing the NREN
- Accountability to the research and education communities and any other important strategic users of the NREN's infrastructure and services
- Ability to take into account the needs of key stakeholders
- Clear and efficient processes for the development and approval of strategies and policies
- Ability to effectively set performance targets, to monitor them and to improve performance
- Ability to enter into legal agreements with suppliers and user institutions
- Ability to take into account changing circumstances and develop new NREN strategies and policies, and to commission new services in an appropriate way to align them with the requirements of the research and education communities
- Ability to shape policies so that they align with policies developed at a European level in order to allow effective inter-domain working, so that pan-European collaborative research and education can be conducted effectively and efficiently.
- **Are there any more important requirements that need to be captured?**



Governance Models

Model 1

- The NREN is a **legal entity** with a **supervisory board**. In the Anglo-Saxon legal system, where there is no legally required separation between the Board of Supervisors and the General Managers, this would be a Board of Directors including both supervisors and managers.
- The **board** comprises of **members who represent key stakeholders from the research and education communities and from the government** (e.g., the government departments for education, for research etc.). In the Anglo-Saxon system, the General Manager(s) of the NREN will be members of the board as well.
- Other, **minor stakeholders** are represented on a **committee of stakeholders**, and the chair of that committee is also a member of the board.
- The **Chief Executive Officer or General Manager** of the NREN chairs the **NREN management team**, which consists of the senior managers of the organisation.



Governance Models

Model 2

- The NREN is **not a legal entity** but has a **board**.
- The **board** comprises of **members who represent key stakeholders from the research and education communities and from the government** (e.g., the government departments for education, for research etc.). In the Anglo-Saxon legal/organisational culture, the General Manager(s) of the NREN will be members of the board as well.
- Other, **minor stakeholders** are represented on a **committee of stakeholders**, and the chair of that committee is also a member of the board.
- The **Chief Executive Officer or General Manager** of the NREN chairs the **NREN management team**, which consists of the senior managers of the organisation.



Protocols for managing e-2-e services

- Agree a set of technical solutions
- Establish a working group to develop and agree policies for inter-working of e-2-e services
- Approve policies (NREN-PC?)
- Pilot implementation of policies by selected NRENs and user communities
- Roll out the solutions across different NRENs and user communities



Questionnaire Results

Some interesting results follow!!



Questionnaire Results

Type of participation in pan-European research and education network policy development and implementation	Number	% of NRENs that responded
The NREN fully participates in the development and setting of policies at a European level and implements the agreed and recommended policies.	7	28%
The NREN participates in the development and setting of policies at a European level and implements the agreed and recommended policies only when these policies are in-line with the existing or future policies of the NREN or government.	9	36%
The NREN participates in the development and setting of policies at a European level and implements the agreed and recommended policies only when these policies are in-line with the existing NREN or government policies.	2	8%
The NREN monitors European policy setting and does generally not implement European policies unless they have a direct relevance to networking services in existing use on the NREN.	7	28%
Total responding	25	76%

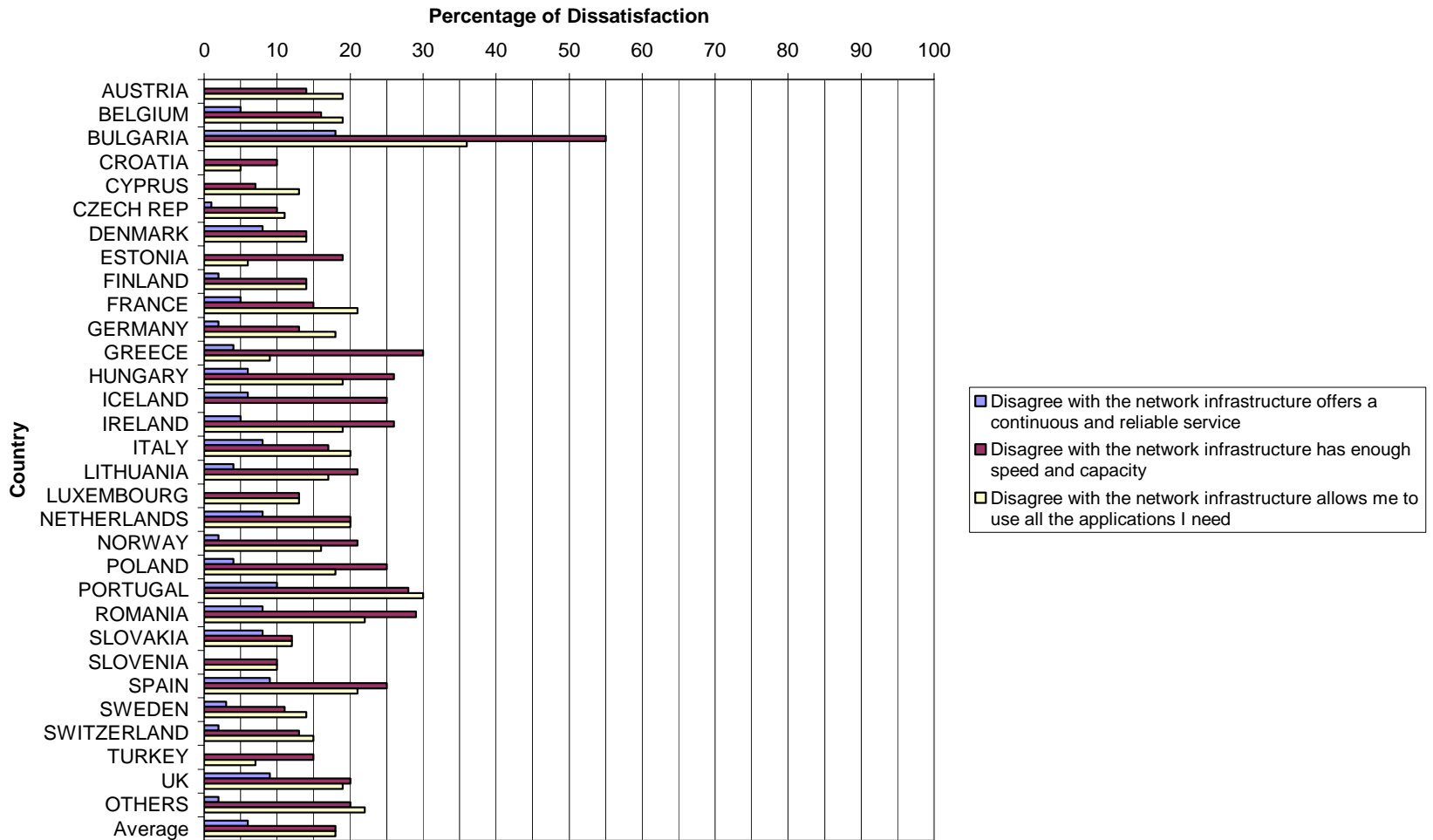


Questionnaire Results

Funding for special projects	Number	% of NRENs
When an NREN organisation is not funded to support a special project the organisations running the special project should be allowed to acquire and run their own networking services.	18	55%
When an NREN organisation could be funded to support and is technically able to support networking services required for special projects the NREN should always be offered the option to do so.	24	73%
Using alternative arrangements to the use of GÉANT when developing pan-European collaboration projects or links to other countries NRENs when more cost effective	15	45%
Using alternative arrangements to the use of GÉANT when developing pan-European collaboration projects or links to other countries NRENs when costs of the alternative arrangements are similar to those for using GÉANT	7	21%
Using alternative arrangements to the use of GÉANT when developing pan-European collaboration projects or links to other countries NRENs when costs of the alternative arrangements are higher than those for using GÉANT	5	15%

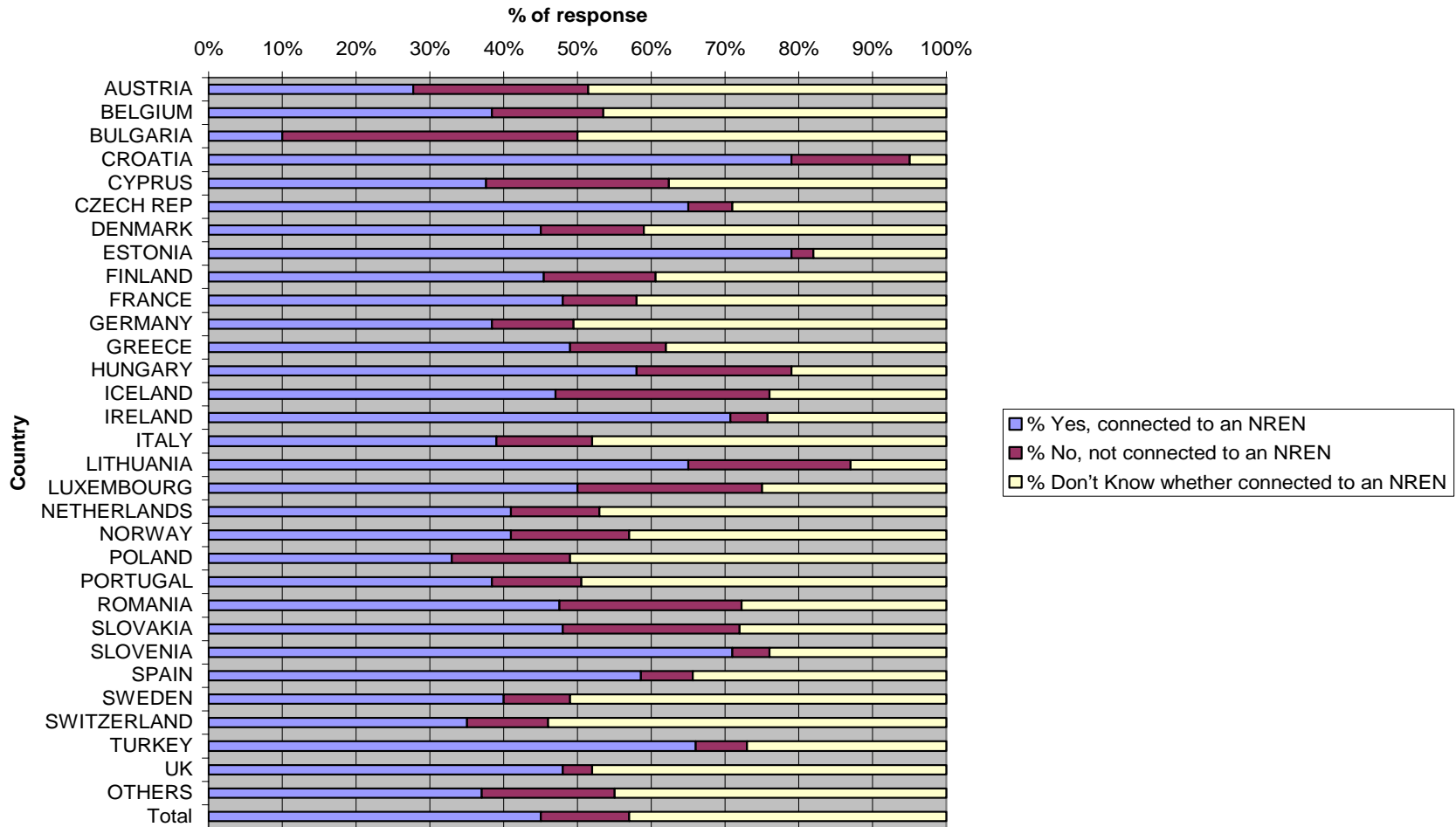


Dissatisfaction with services



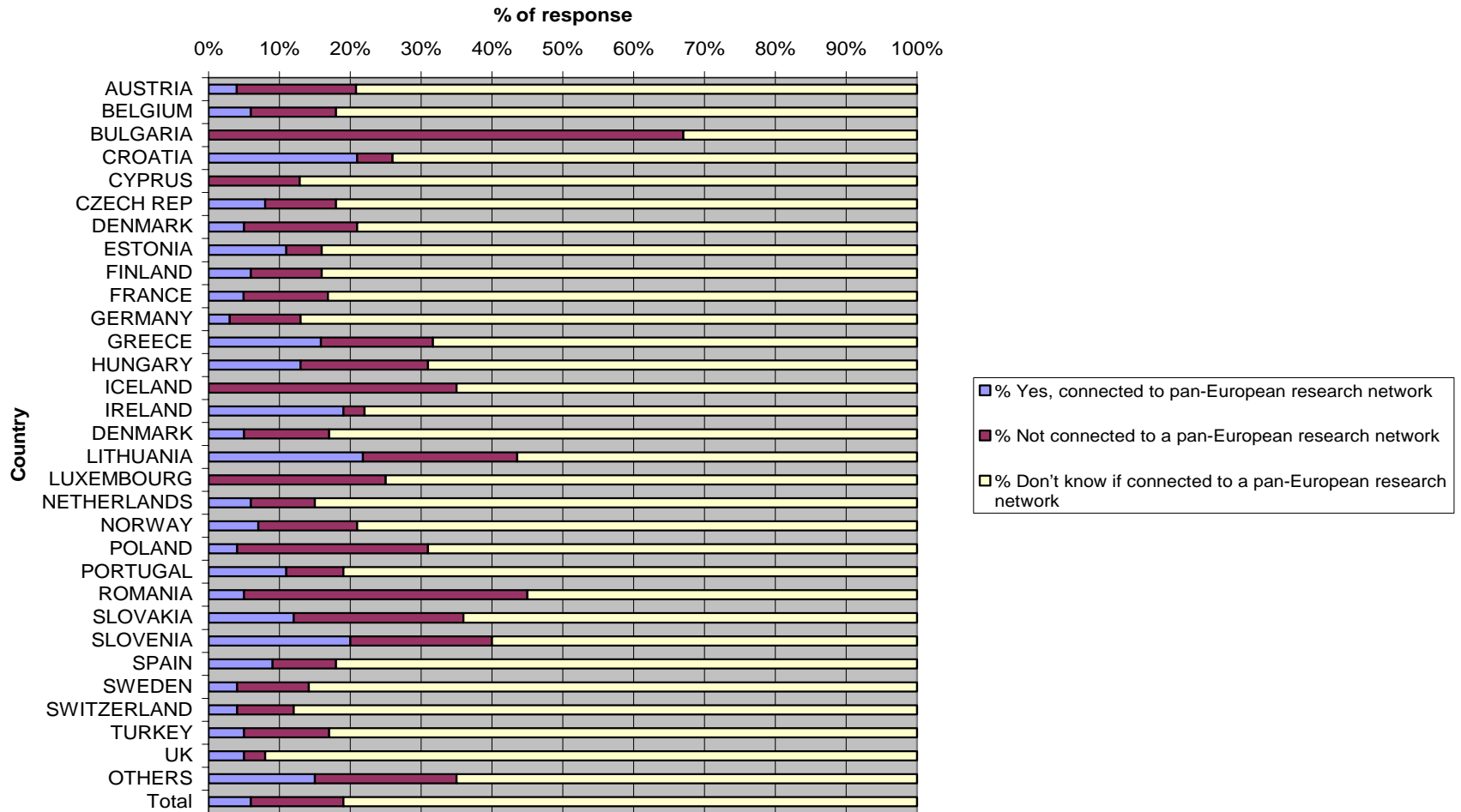


Researchers awareness of NRENs





Researchers awareness of GÉANT





Questionnaire Results

Study conclusions

- a) NRENs are successfully delivering services to the R&E communities and some have or are connecting new groups of users.
- b) NRENs have many different governance structures, funding models and decision making processes.
- c) NRENs are widening their remits, getting involved in strategic developments and not just delivering networking services to the research and education communities.
- d) NRENs need to put in place the structures that will allow them to better plan, develop, implement and support state-of-the-art services that will be needed to support collaborative research and education throughout Europe and beyond.
- e) NRENs need to increase collaboration on policy-making issues within the community of NRENs but also with the research and education community. This can be done by building on existing and successful collaborative structures such as TERENA, and by ensuring that NRENs make best use of work carried out elsewhere so that duplication of effort does not occur.



Key Questions

- Do you agree with the recommendations made?
- If not what would you like to change based on the evidence?
- Would you like to add recommendations based on the evidence from the questionnaire?
- Which recommendations are the most important ones that should be highlighted in the summary report?



Key Questions for you!

- How can NREN organisational arrangements and governance be improved so that end-to-end services can be effectively delivered across Europe & beyond?
 - What two or three things would you do that you think will have a positive impact?
- Which governance model is likely to be most effective?
- What areas should work be carried out on further developing policies?
e.g. end-to-end services, lightpaths



Organisational & Governance Study

- Pass on thanks to those NRENs who filled in questionnaires
- Please send any further ideas, feedback and suggestions to:

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