IPv6 Deployment Survey

Based on responses from the global Regional Internet Registry (RIR) community during June 2013, and compared with those from earlier years

Prepared by Maarten Botterman
maarten@gnksconsult.com

Presented by Franck Le Gall
f.le-gall@inno-group.com

An initiative funded by the European Commission (2012-2013), http://www.ipv6observatory.eu, and supported by the NRO, http://www.nro.net/ipv6

Setting the scene

- The Internet has become a fundamental infrastructure, worldwide, for economic and social activity, and its usage continues to grow exponentially:
    - More users
    - New applications (e.g. mobile, Internet of Things etc.)
- The transition from IPv4 to IPv6 is the only sustainable option in the long run.
- A smooth transition requires understanding the challenges and a timely start.

Global IPv6 Deployment Monitoring Survey

- Aim to establish comprehensive view of present IPv6 penetration and future IPv6 deployment plans by surveying Internet providers and users in the RIR communities around the world
- Process
  - Prepared and carried out by GNKS in close collaboration with AFRINIC, APNIC, ARIN, LACNIC and RIPE NCC
  - Survey was kept short and focused on essentials. Changes to the survey were kept to a minimum and are taken into account in the analysis
  - Privacy guaranteed
- History
  - ARIN carried out such a survey with its members in March 2008, a starting point for the current survey
  - RIPE NCC and APNIC carried out this same survey in 2009
  - In 2010, 2011, 2012 and 2013, all RIRs participated to the survey making it truly global

Summary report on 2013 results

1 – Respondents' profile

2 – Experience and assumptions

3 – Planning

Section 1 – Respondents' profile

- Respondents' profile remained generally consistent over the years, and again in 2013
- Main change in 2013 is in responding countries, not in global spread nor in composition of sort of responders
  - "government" respondents continued to grow in numbers, which may be congruent with higher policy interest in IPv6
- *Median respondent*
  - *for-profit ISP in the RIPE NCC region that signed a registration services agreement and serves up to 10,000 customers with less than 50 personnel.*

In which country/economy is your organization registered?

- 1515 respondents from 131 countries/economies
- Top 10 respondent countries in 2013

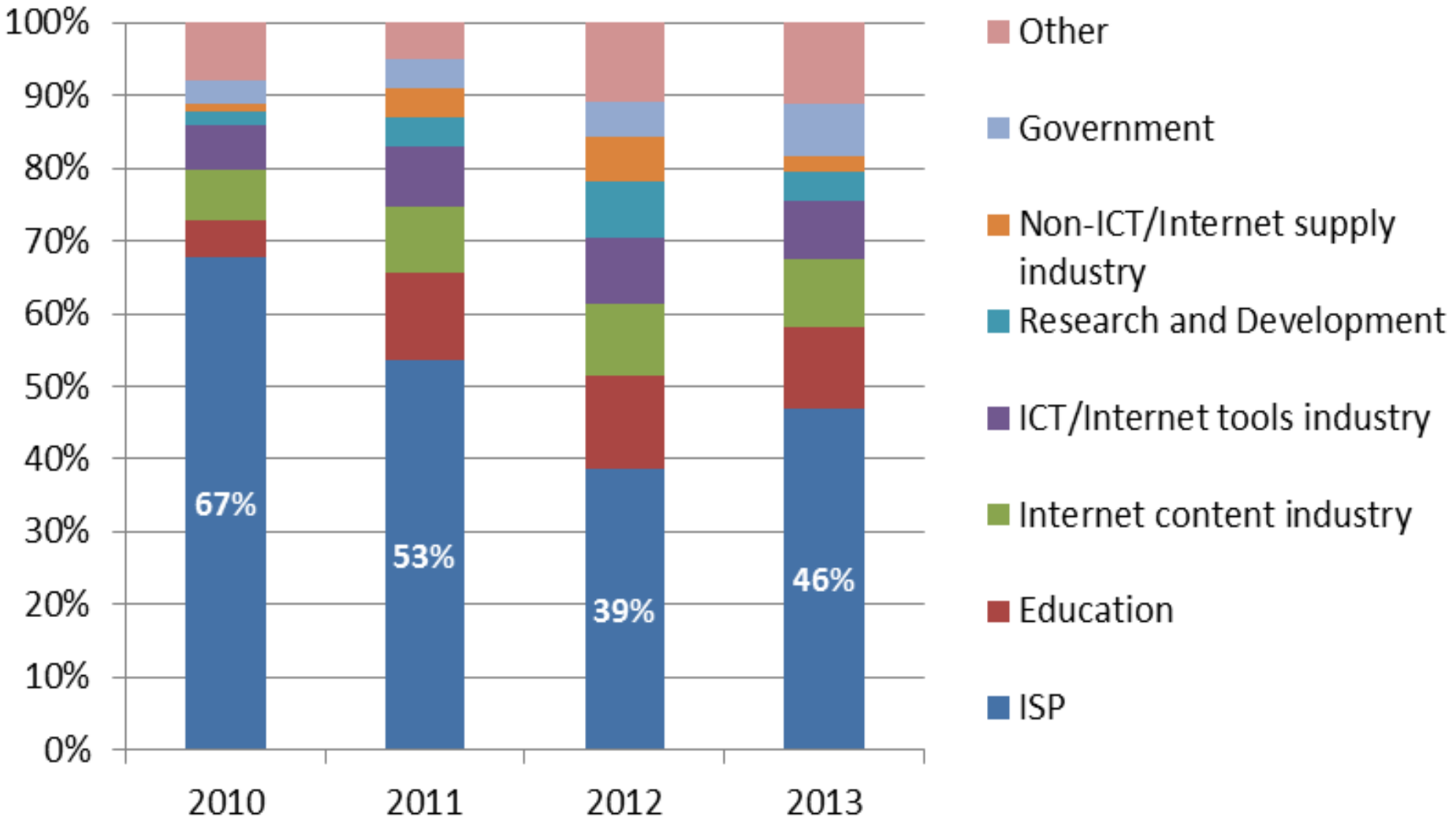
1.	**USA**	**215**	**6.**	**Brazil***	**47**
2.	Germany	74	7.	France	47
3.	**United Kingdom**	**66**	**8.**	**India***	**47**
4.	Russia	53	9.	Indonesia*	40
5.	**Netherlands**	**48**	**10.**	**Australia**	**35**
		* New in Top 10			

Notable Changes

- Taiwan from 104 to 17 respondents
- Germany from 341 to 74 respondents
- USA from 306 to 215 respondents
- Brazil, India and Indonesia new

source: GNKS 2013

Which category which best describes your organization?



N=1515

source: GNKS 2013

Are you a mobile network operator ?

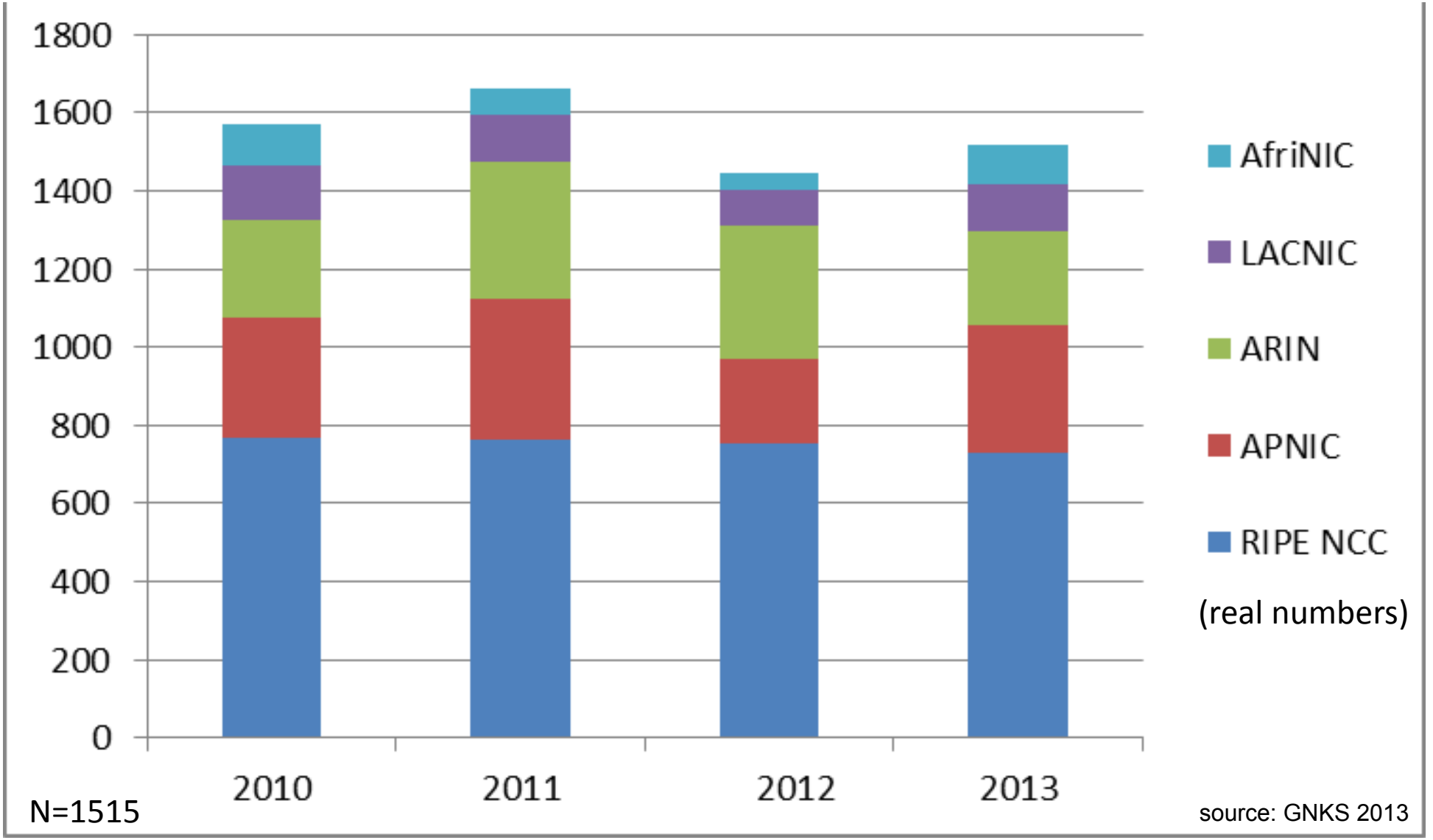
- 2012 12% mobile network operators
- 2013 13% mobile network operators

- No significant change compared to 2012
- No data from earlier years

N=1515

source: GNKS 2013

To which RIR does your country/ economy belong?



Has your organization signed a Registration Services Agreement with your RIR?

- More respondents have signed a registration services agreement in 2013

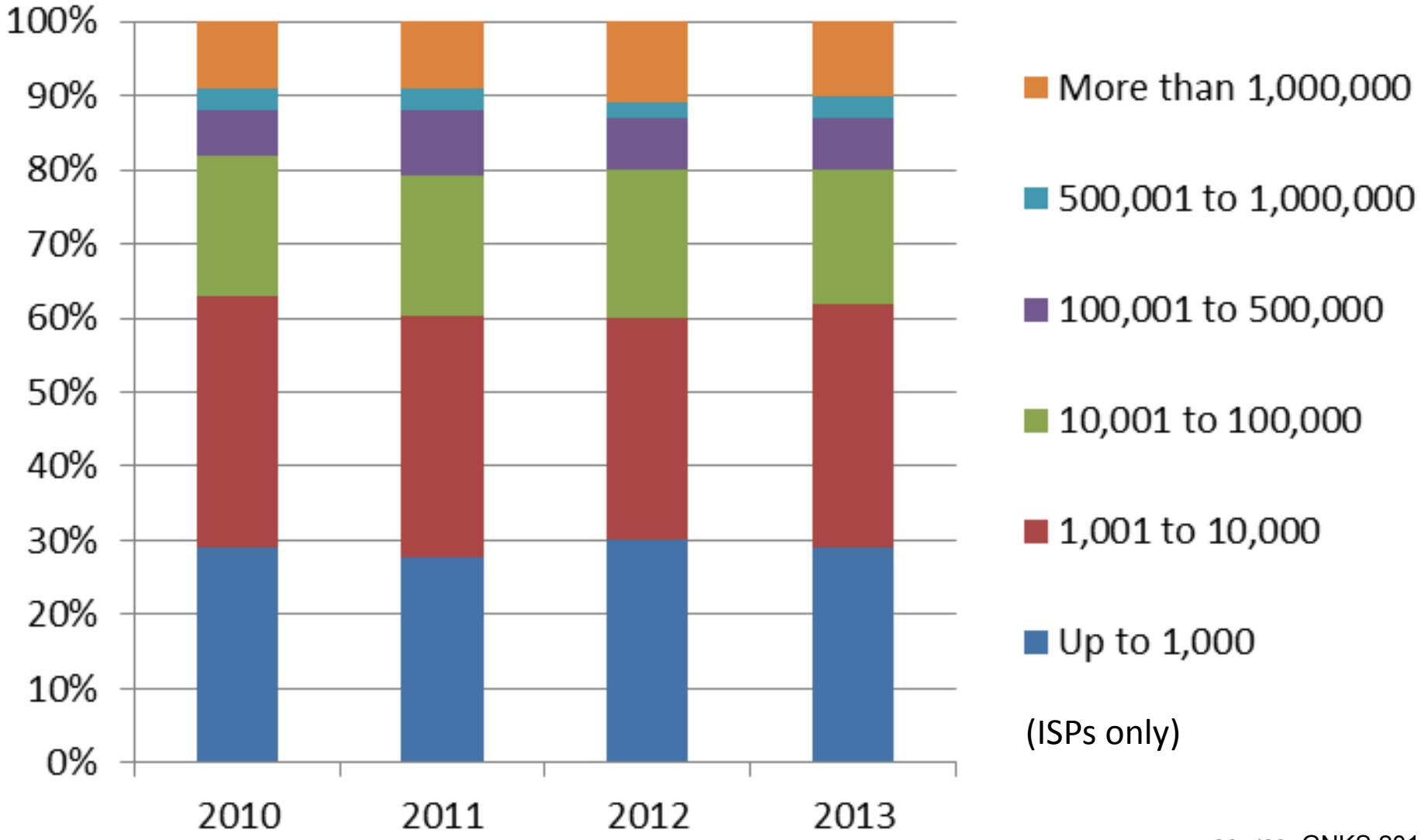
	2011	2012	2013
Yes	54%	40%	68%
No	16%	25%	5%
Don't know	29%	35%	27%

ISPs only

N=684

source: GNKS 2013

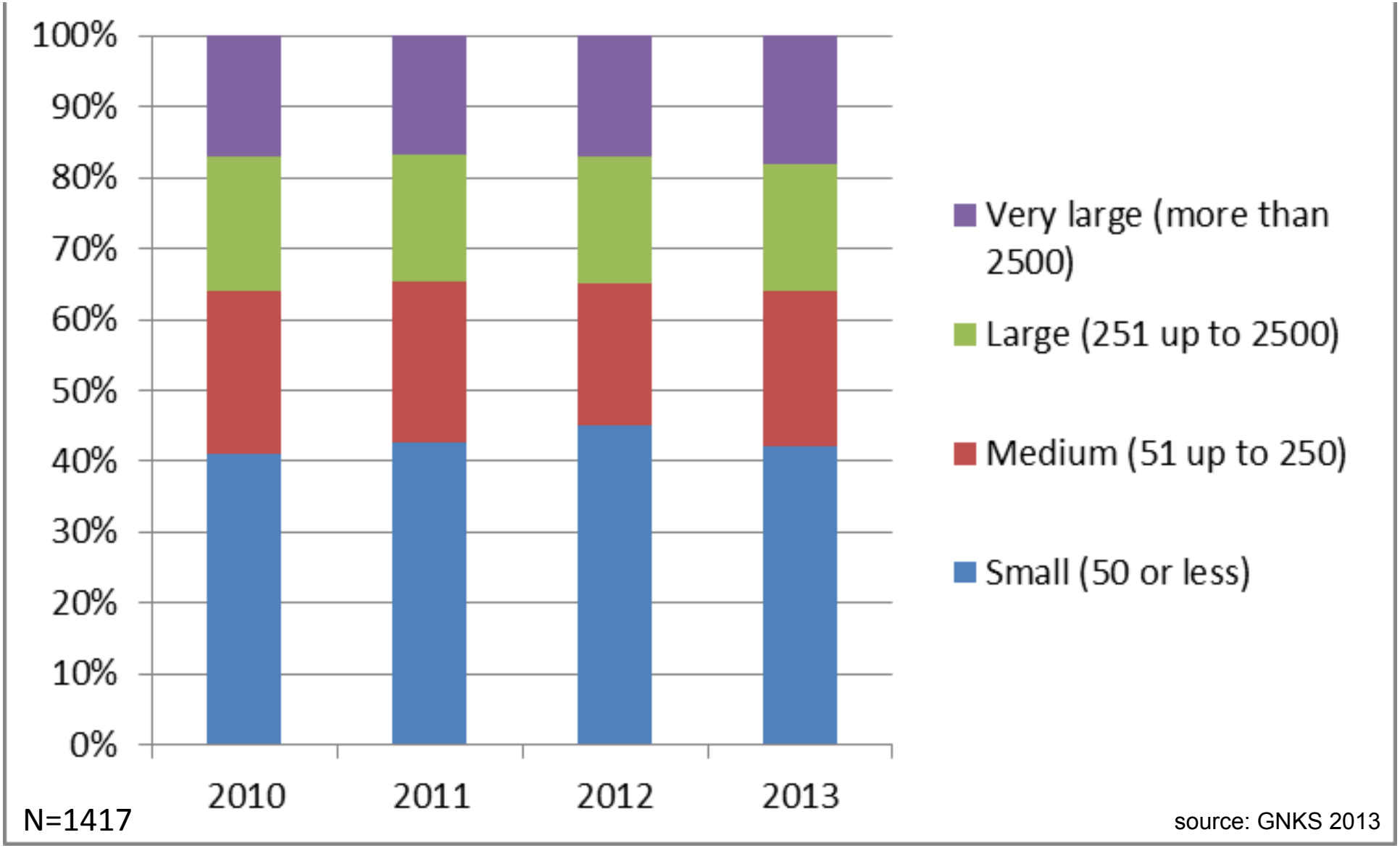
How large is your customer base?



N=646

source: GNKS 2013

What is the size of your organization?



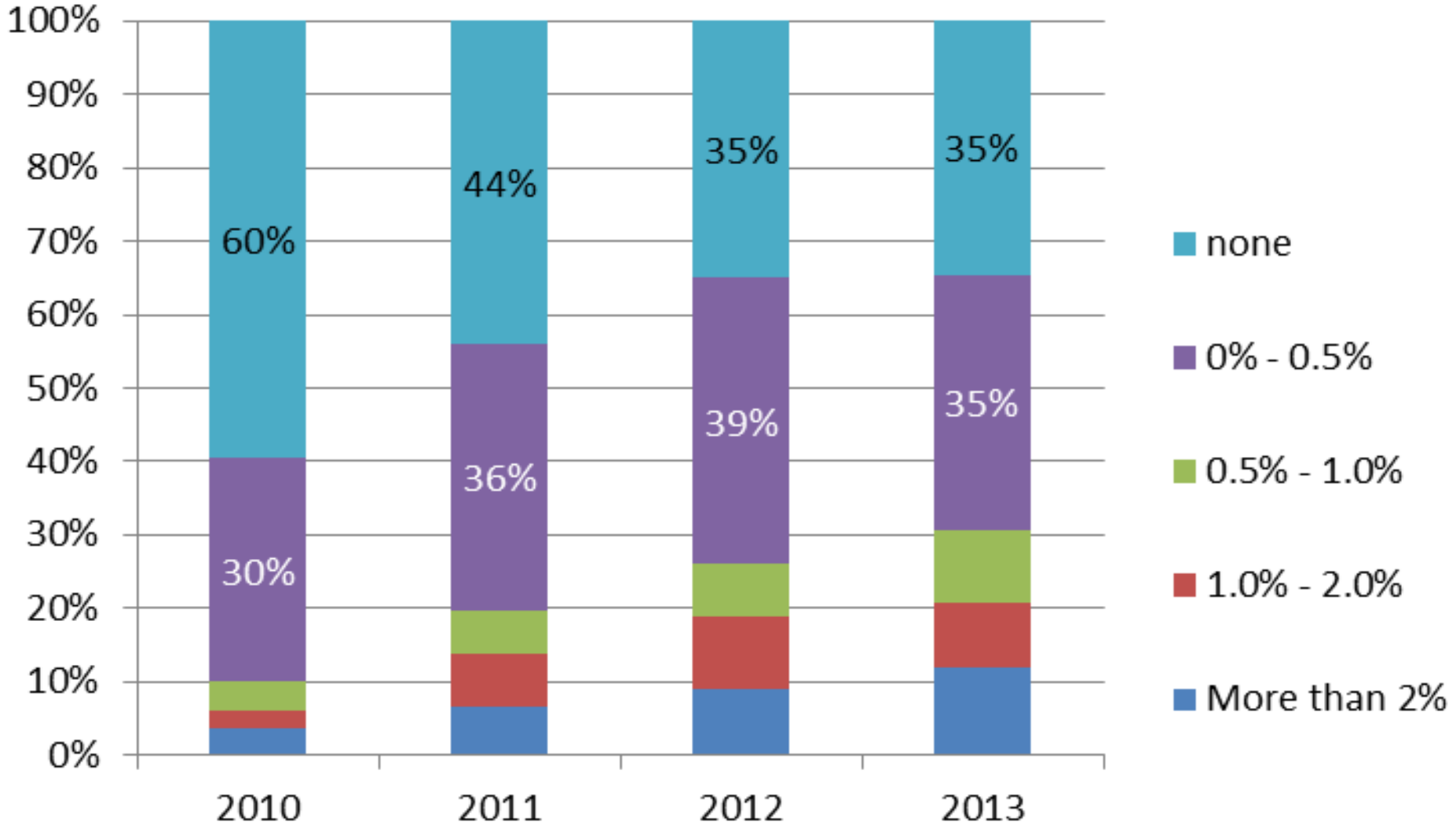
N=1417

source: GNKS 2013

Section 2 – Experience and assumptions

- Overall, most ISPs have IPv6 experience (65% of respondents) & this is stable across years
- Significance of IPv6 as a service is increasing:
  - More ISPs indicate more significant usage by their clients (now 31%, >0.5% from last year's 26%)
  - Promoting IPv6 to customers is even more part of the "mix" (now 72%, up from 63% in 2012)
- Biggest hurdle still vendor support
  - 61% of respondents, no significant change
- Biggest problem lack of user demand (55%)

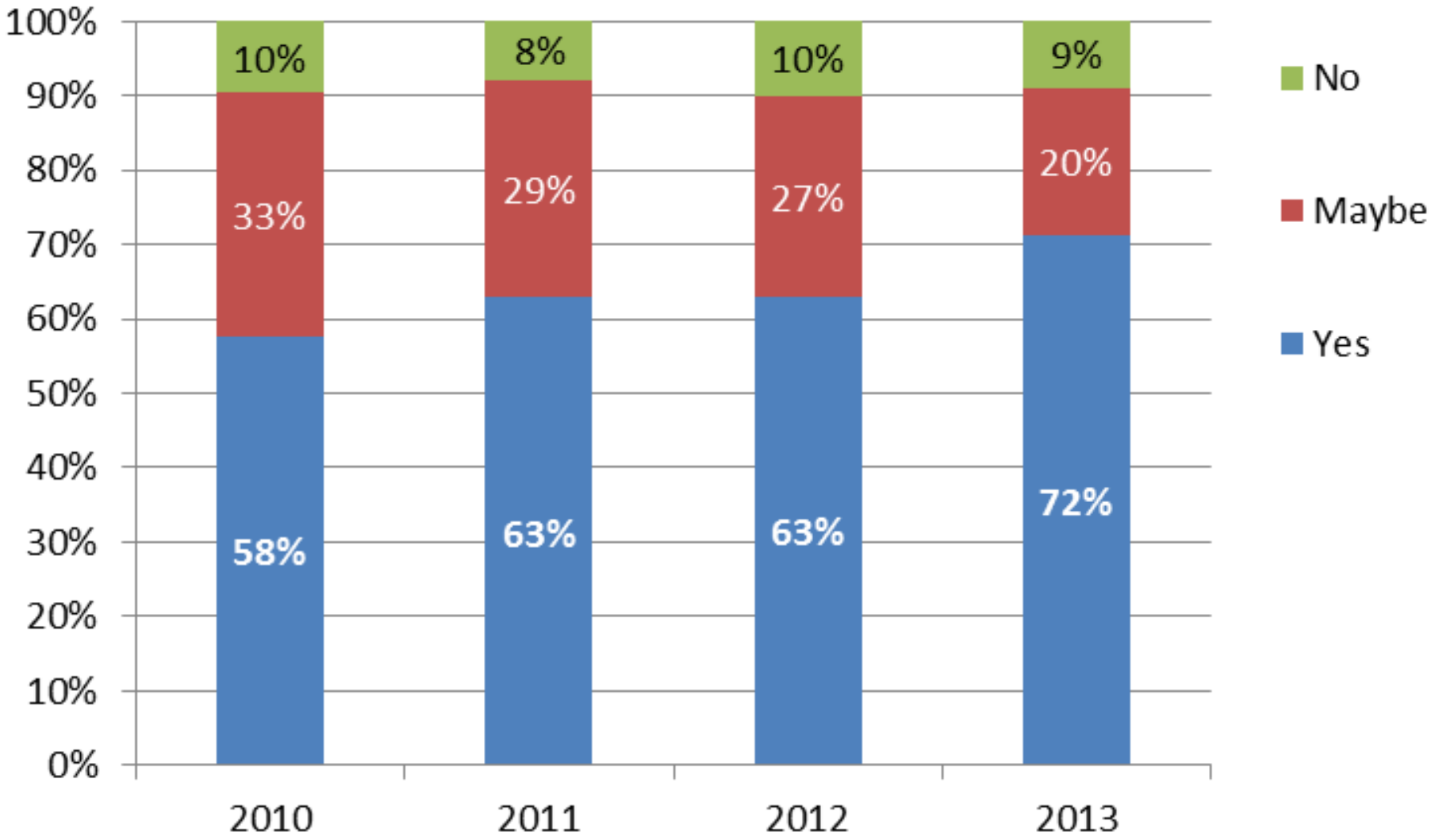
What percentage of your customer base uses IPv6 connectivity?



N=639 ISPs only

source: GNKS 2013

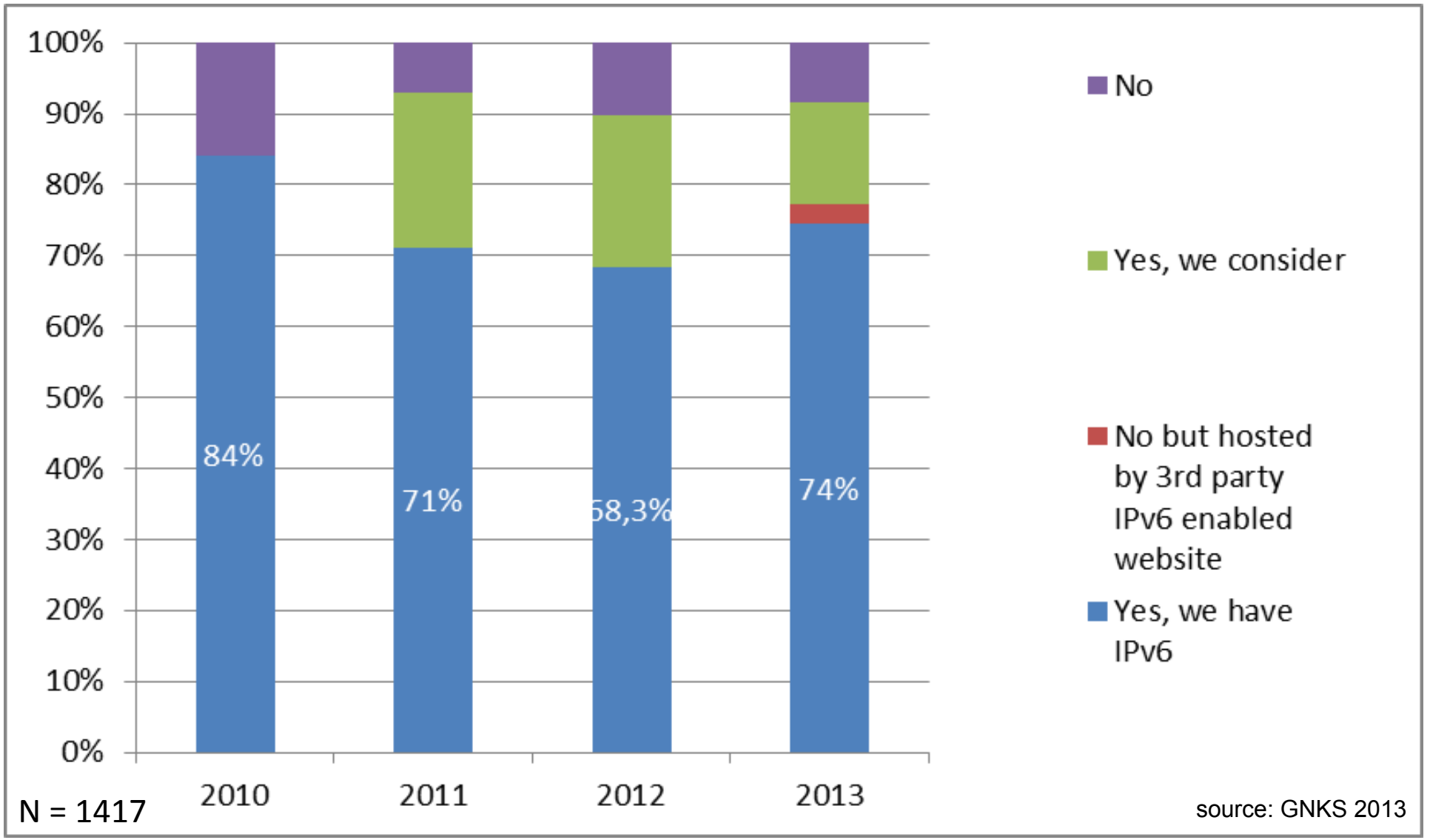
Do you consider promoting IPv6 uptake to your customers?



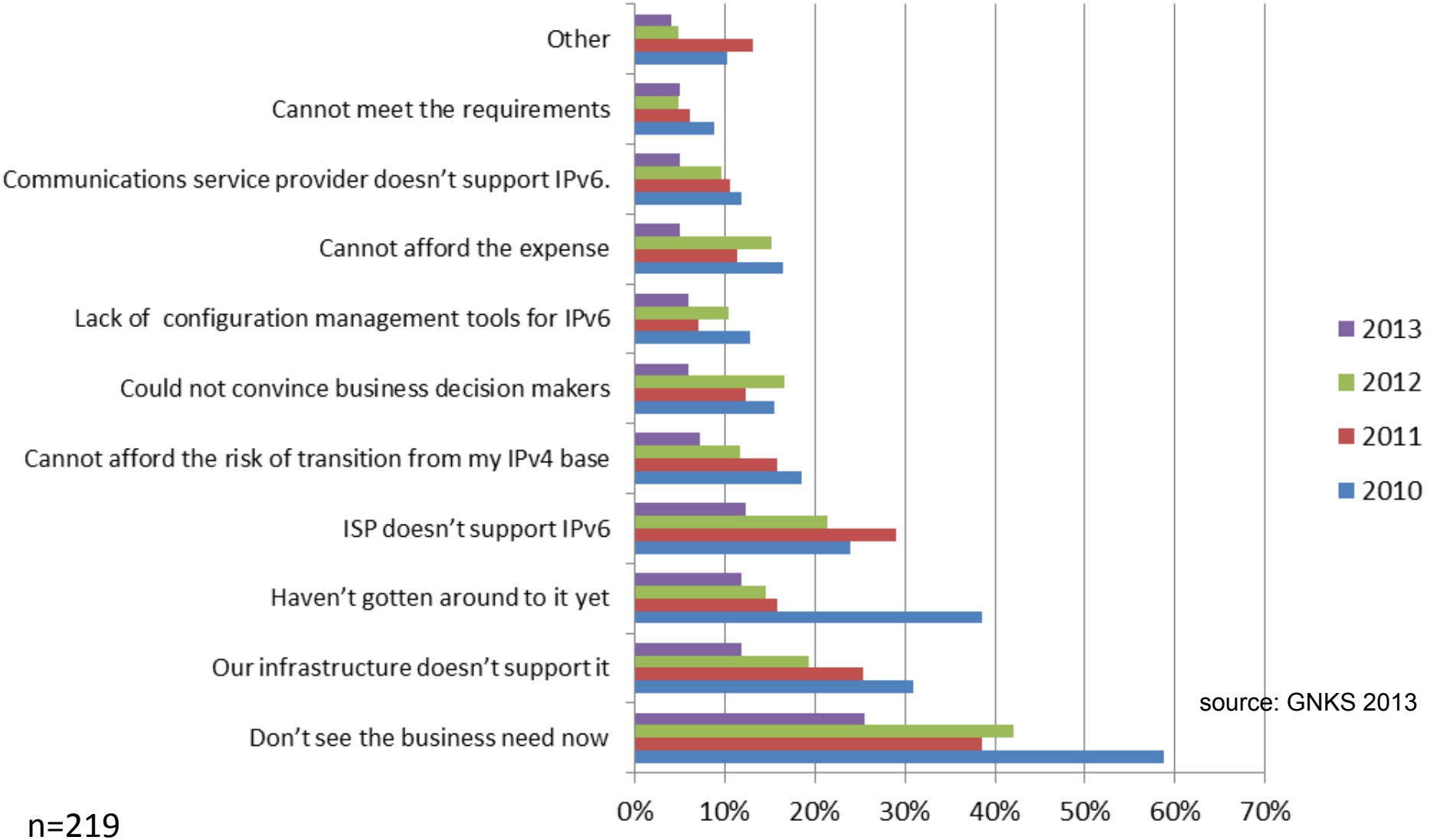
ISPs only N=646

source: GNKS 2013

Does your organization have an IPv6 allocation and/or assignment?

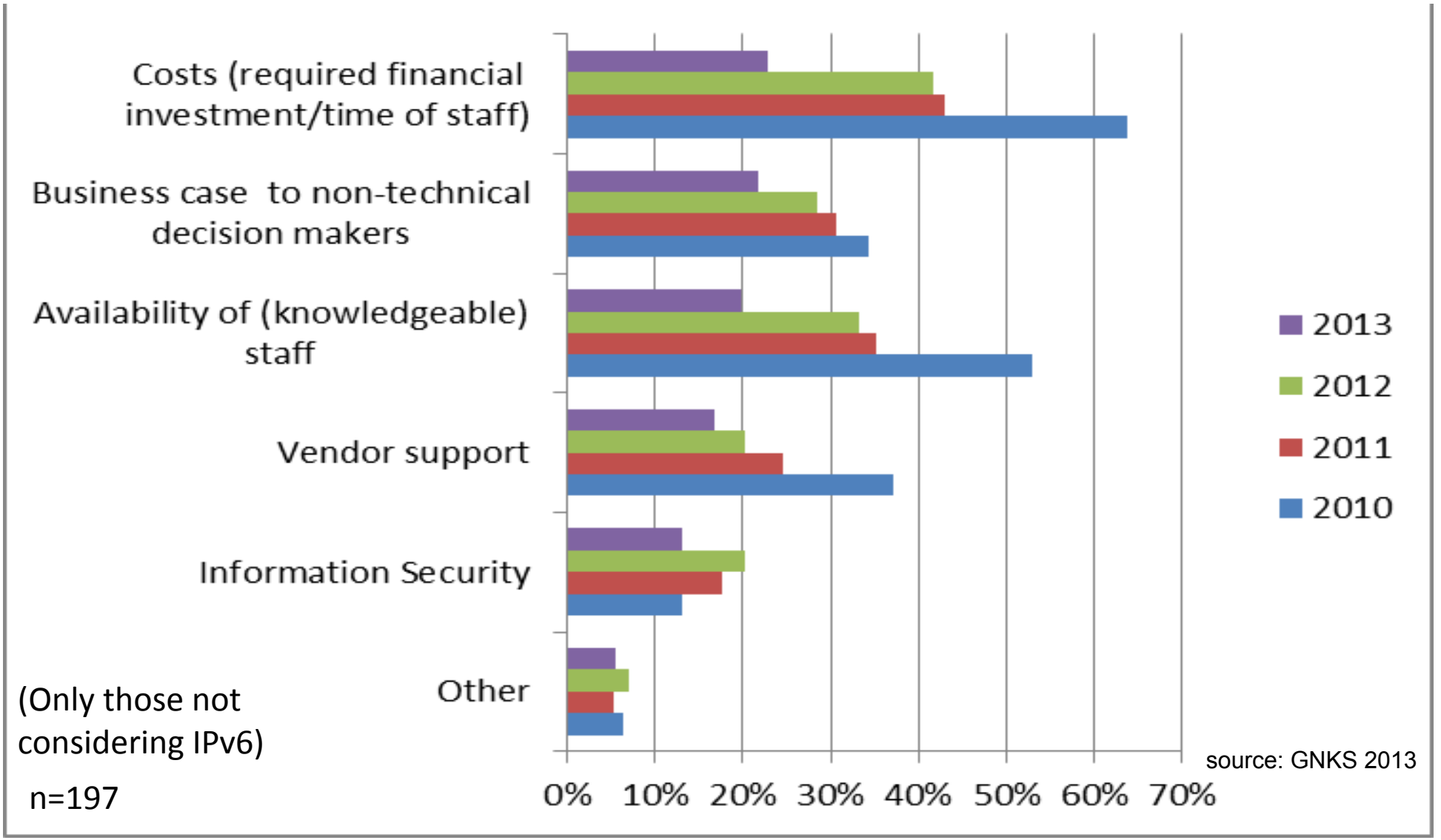


If your organization hasn't considered having an IPv6 allocation/assignment, why not?



n=219

What do you expect to be the biggest hurdle(s) to your organization if you were to deploy IPv6?



(Only those not considering IPv6)

n=197

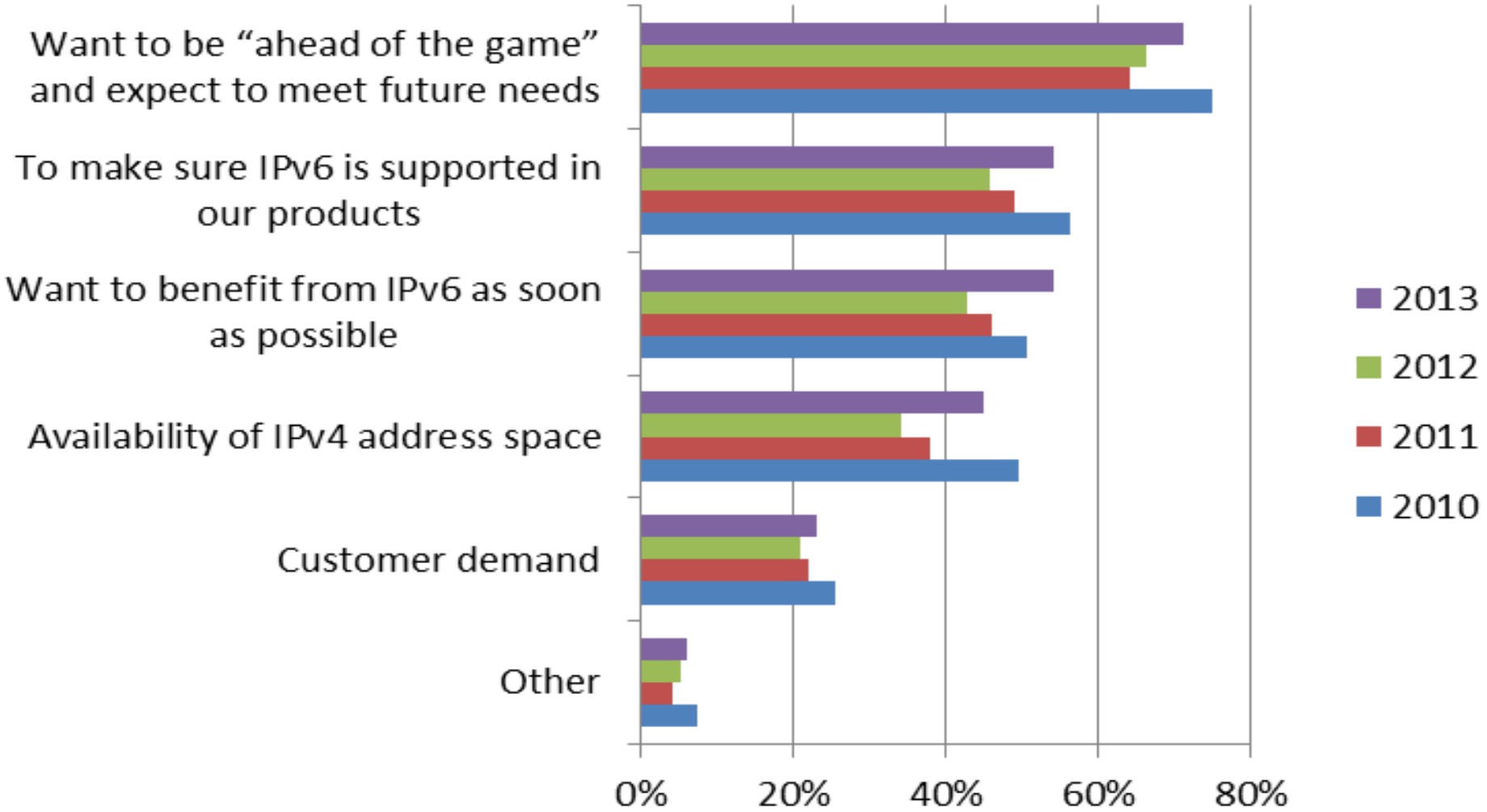
source: GNKS 2013

If you don't plan on transitioning your network over to IPv6, what technology will you use in the future to grow your business as IPv4 depletes?

Out of 34 respondents

- 8 respondents indicate that they have plenty of IPv4 addresses for the time to come
- 3 respondents indicate to be dependent on getting access to IPv6
- (Only) one respondent mentions NAT

What motivated your organization to obtain an IPv6 allocation/assignment?



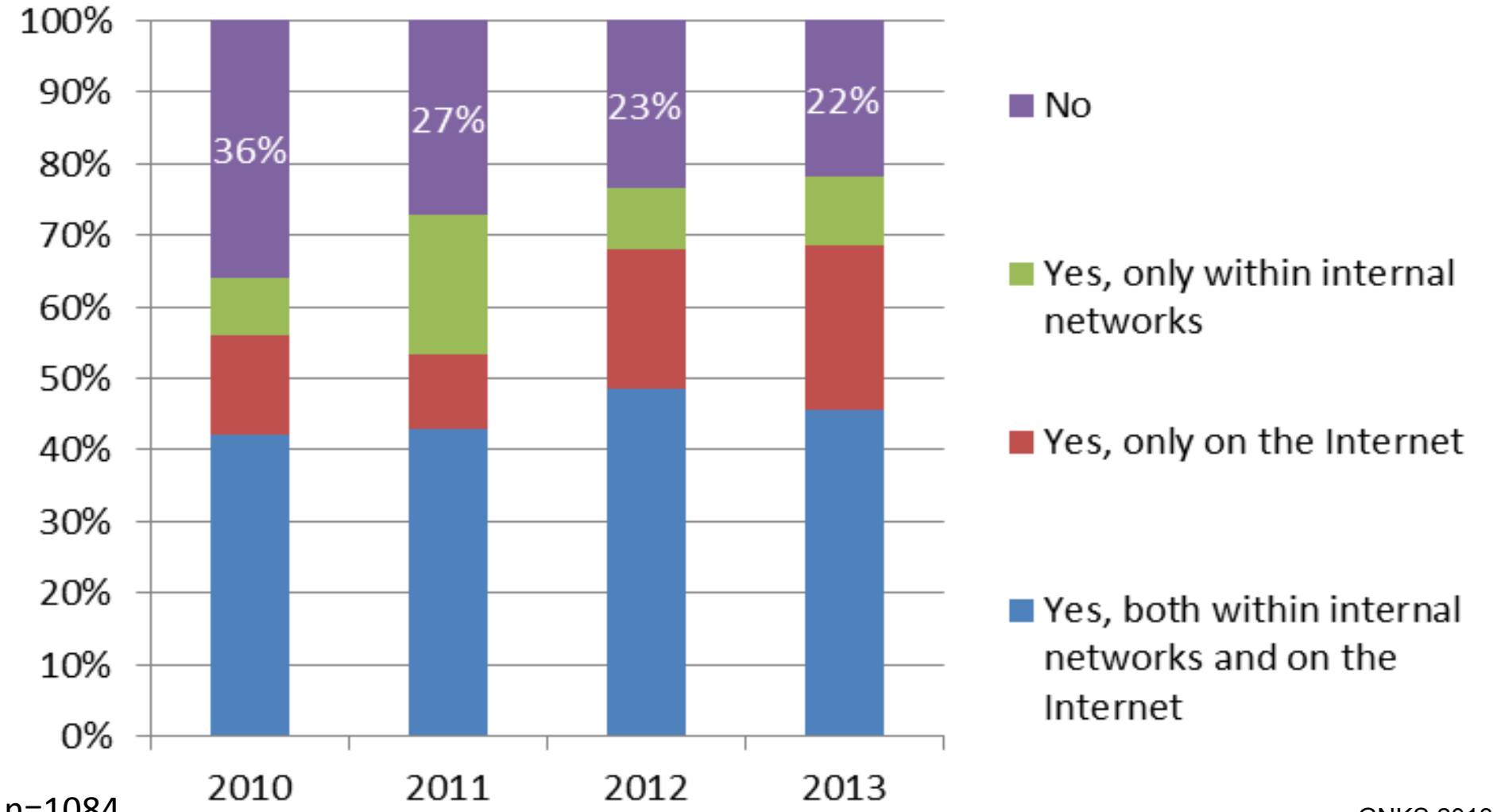
n=1086

source: GNKS 2013

What has been the key argument that has enabled non-technical budget decision makers to appreciate the business case for IPv6 adoption?

- Out of 550 respondents, top key argument is “IPv4 is running out” (100)
- Next group “prepare for future” (86)
- Another large group indicated “customer demand” (36)
- Includes statements like:
  - “If I knew, I'd be using it.”
  - Specific technical and costs advantages of IPv6

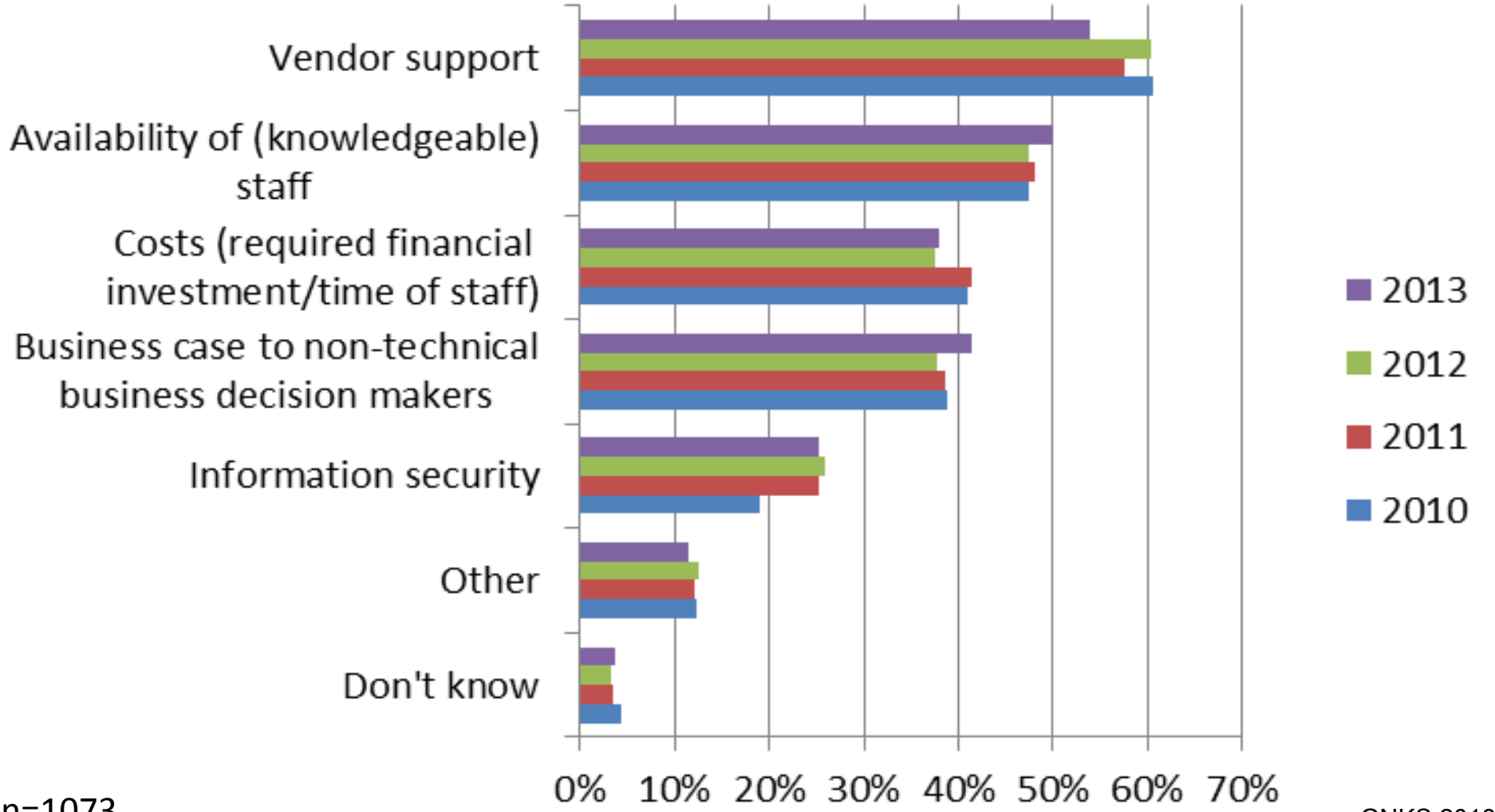
Does your organization have an IPv6 presence ?



n=1084

source: GNKS 2013

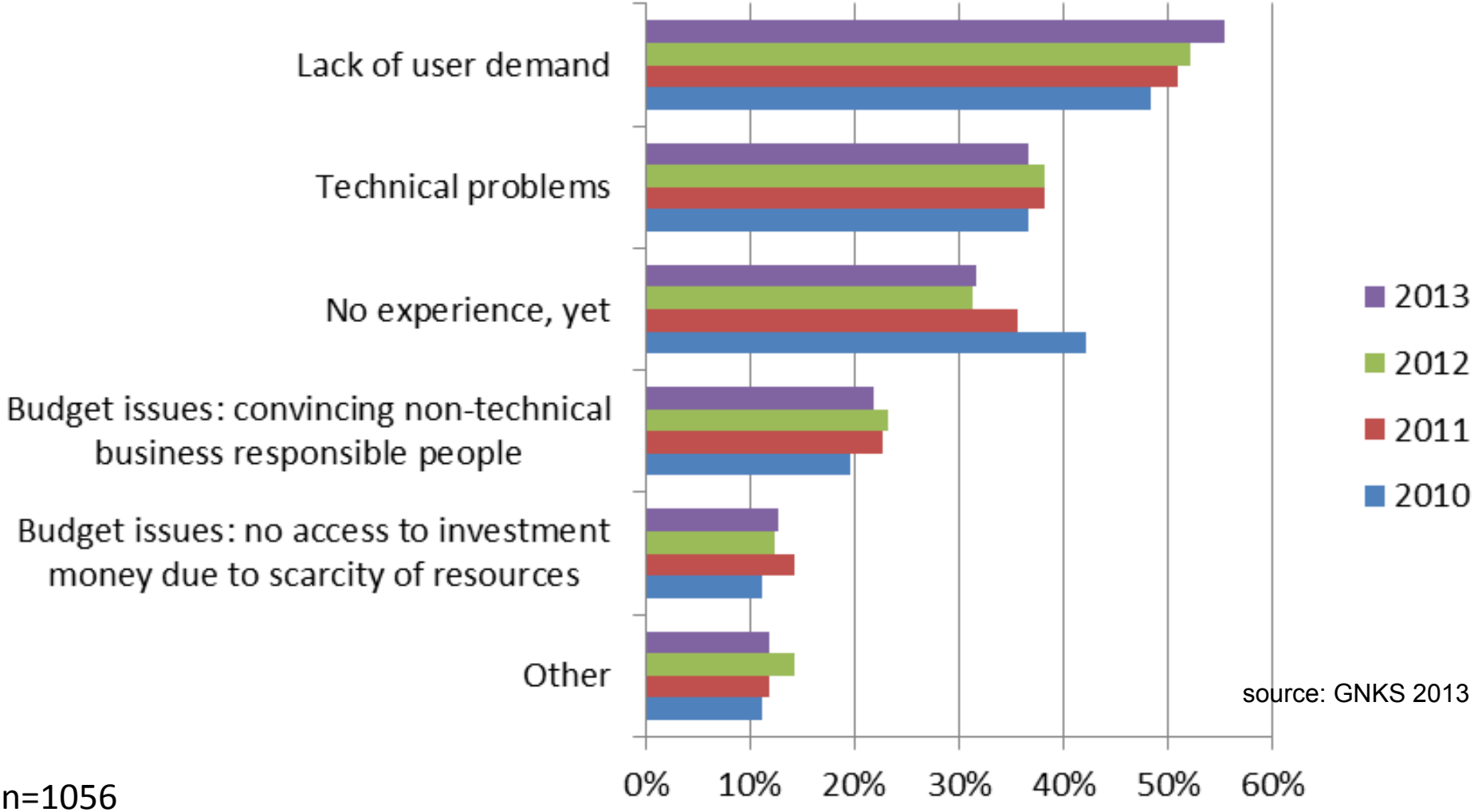
What are likely to be the biggest hurdle(s) when deploying IPv6?



n=1073

source: GNKS 2013

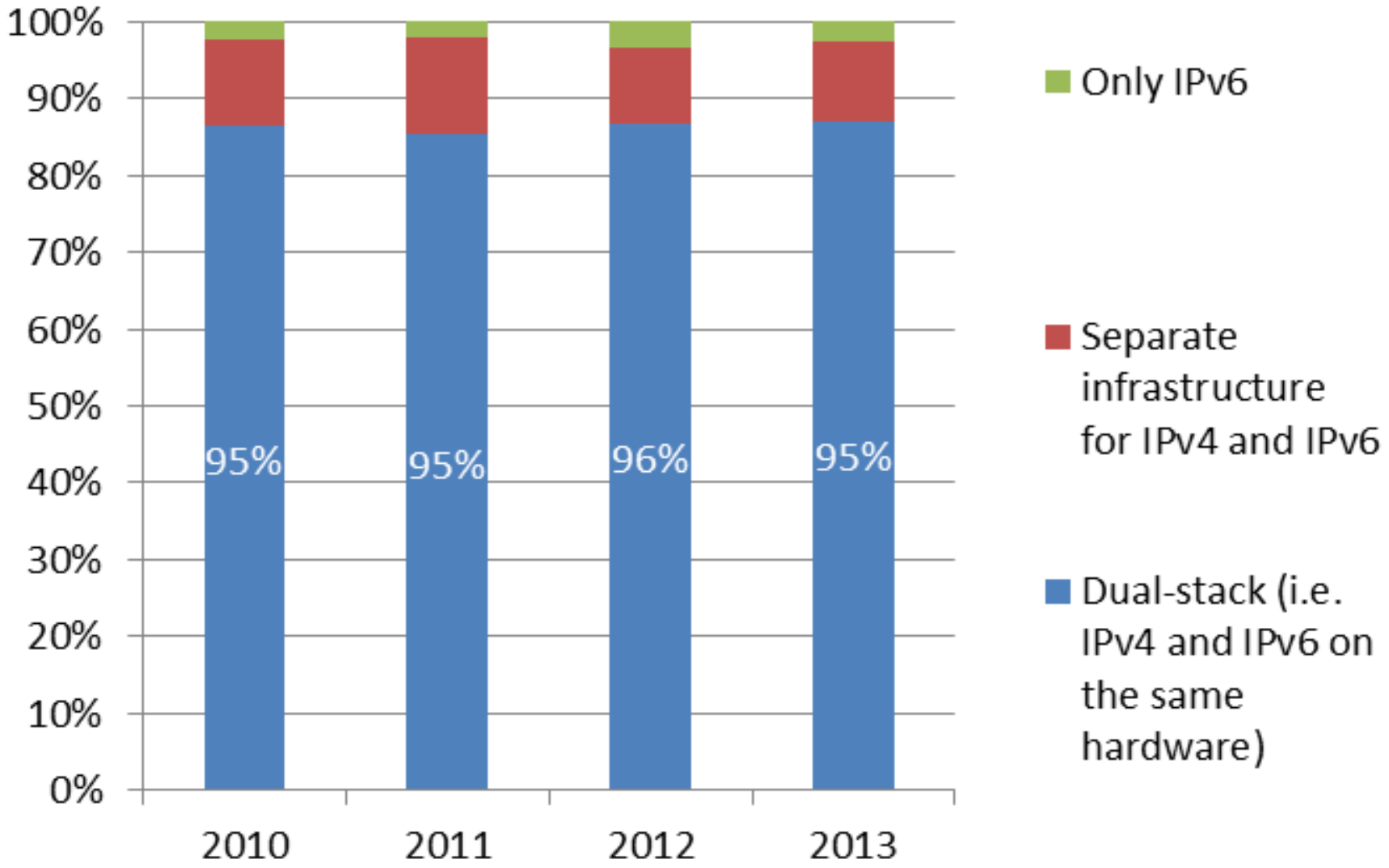
What are the biggest problems with IPv6 in production?



source: GNKS 2013

n=1056

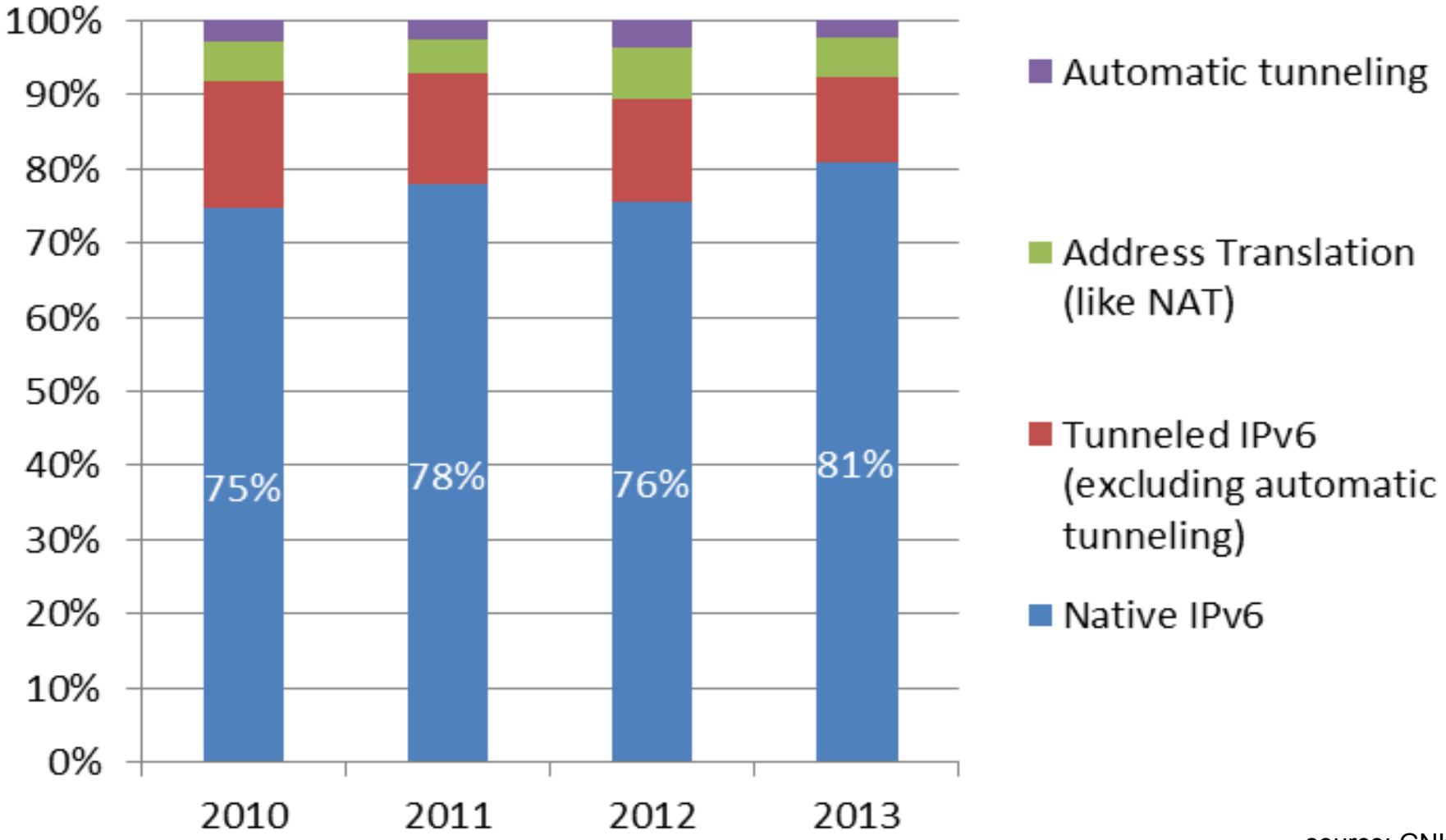
How is your organization's IPv6 setup?



n=1000

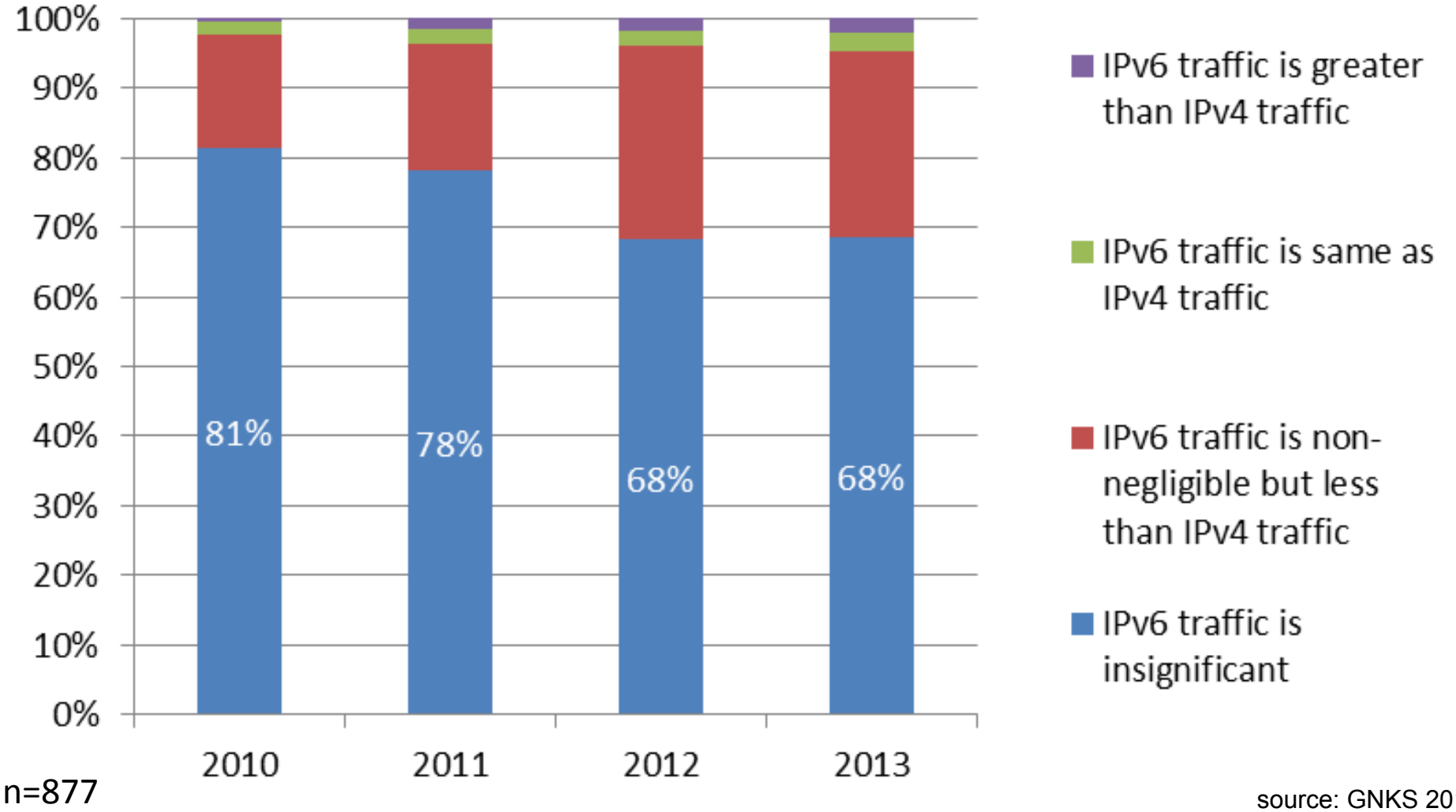
source: GNKS 2013

What is the nature of your organization's IPv6 production services?



source: GNKS 2013

If your organization has IPv6 in production, how does the amount of IPv6 traffic compare to your IPv4 traffic?



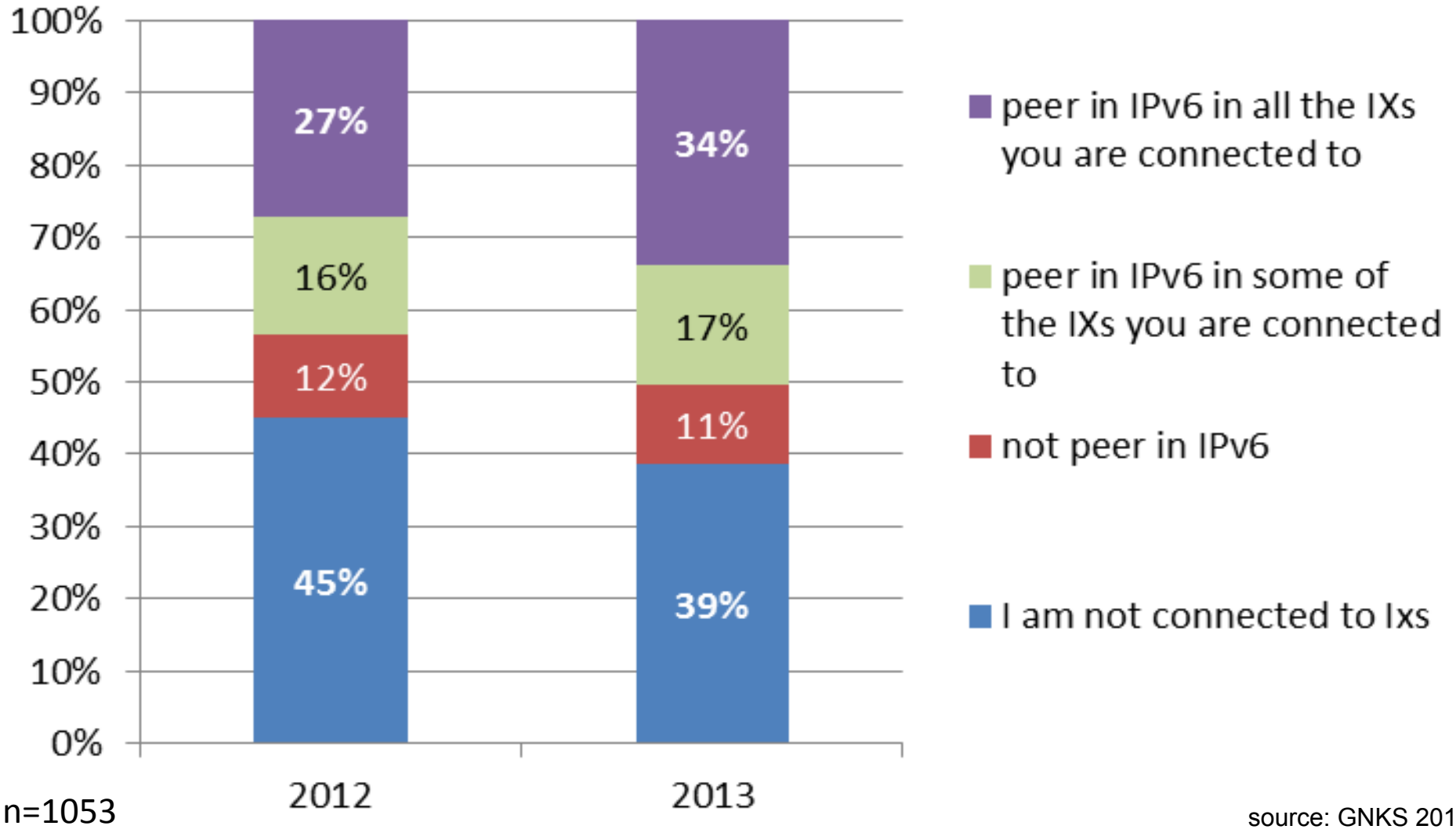
n=877

source: GNKS 2013

What type of applications generate the most IPv6 traffic for your organization?

- By far most respondents indicate http, web browsing, followed by DNS
- Wide range of responses

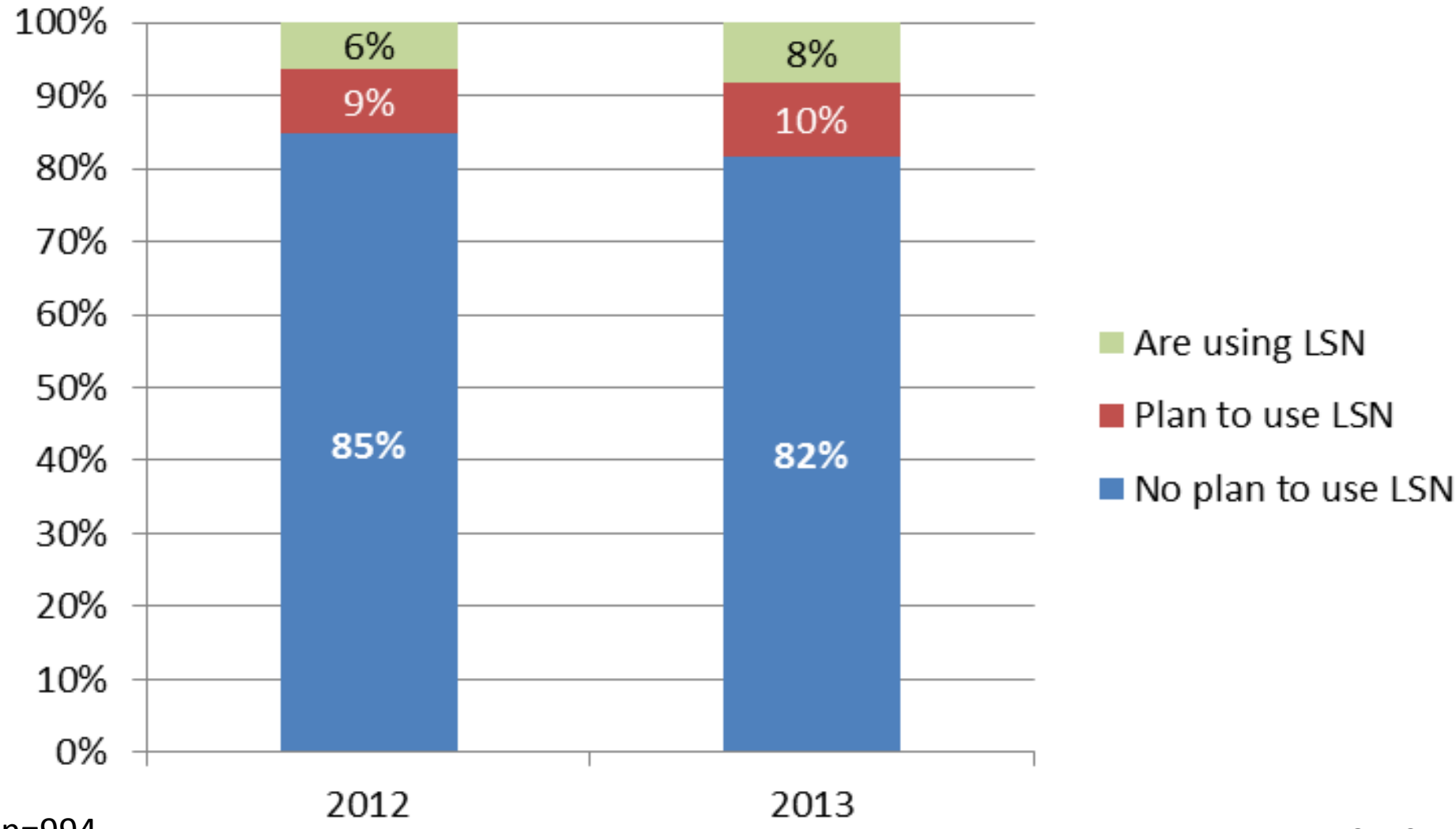
If your organization is connected to one or several Internet Exchanges (IXs), do you…?



n=1053

source: GNKS 2013

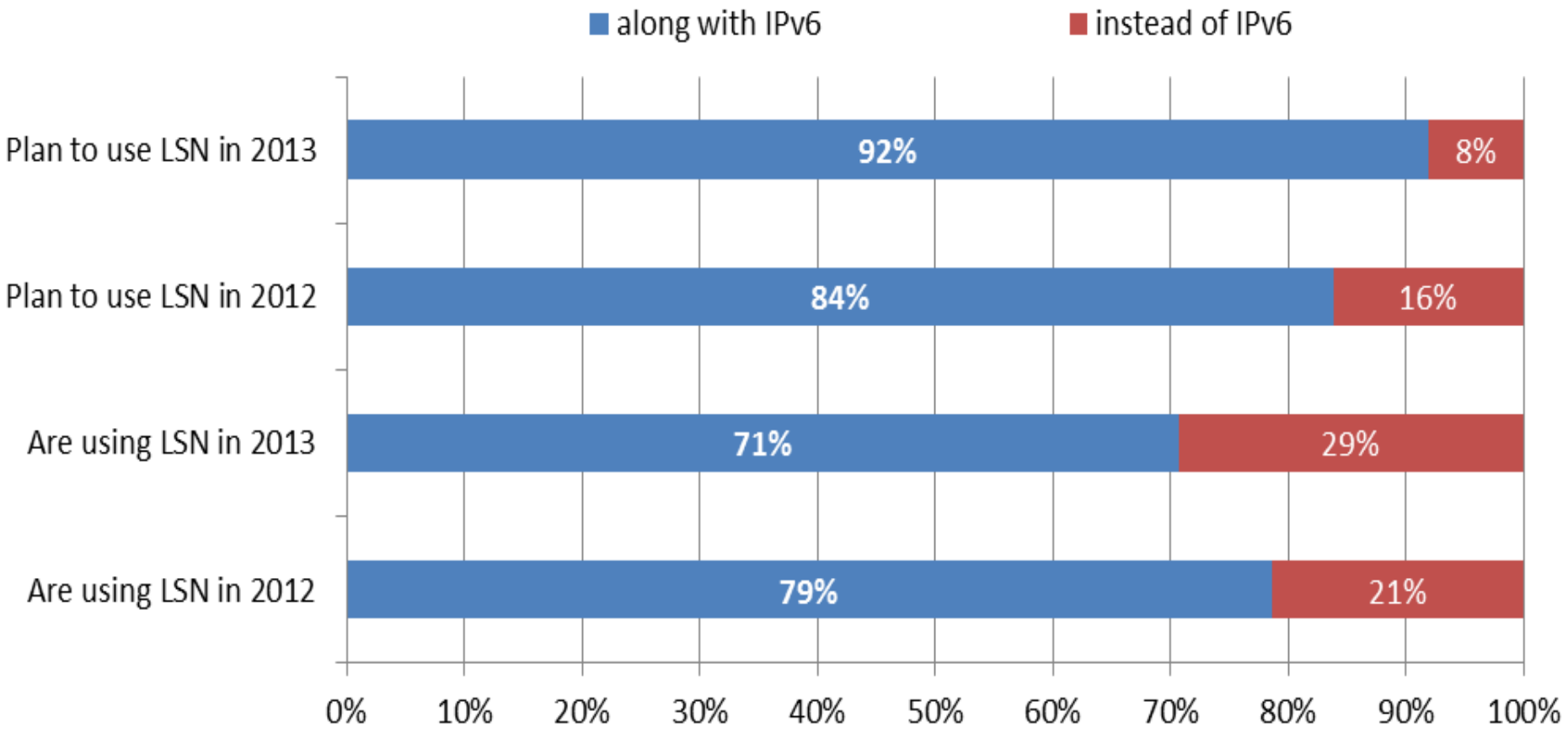
Do you use Large Scale NAT (LSN) aka CGN (Carrier Grade NAT)?



n=994

source: GNKS 2013

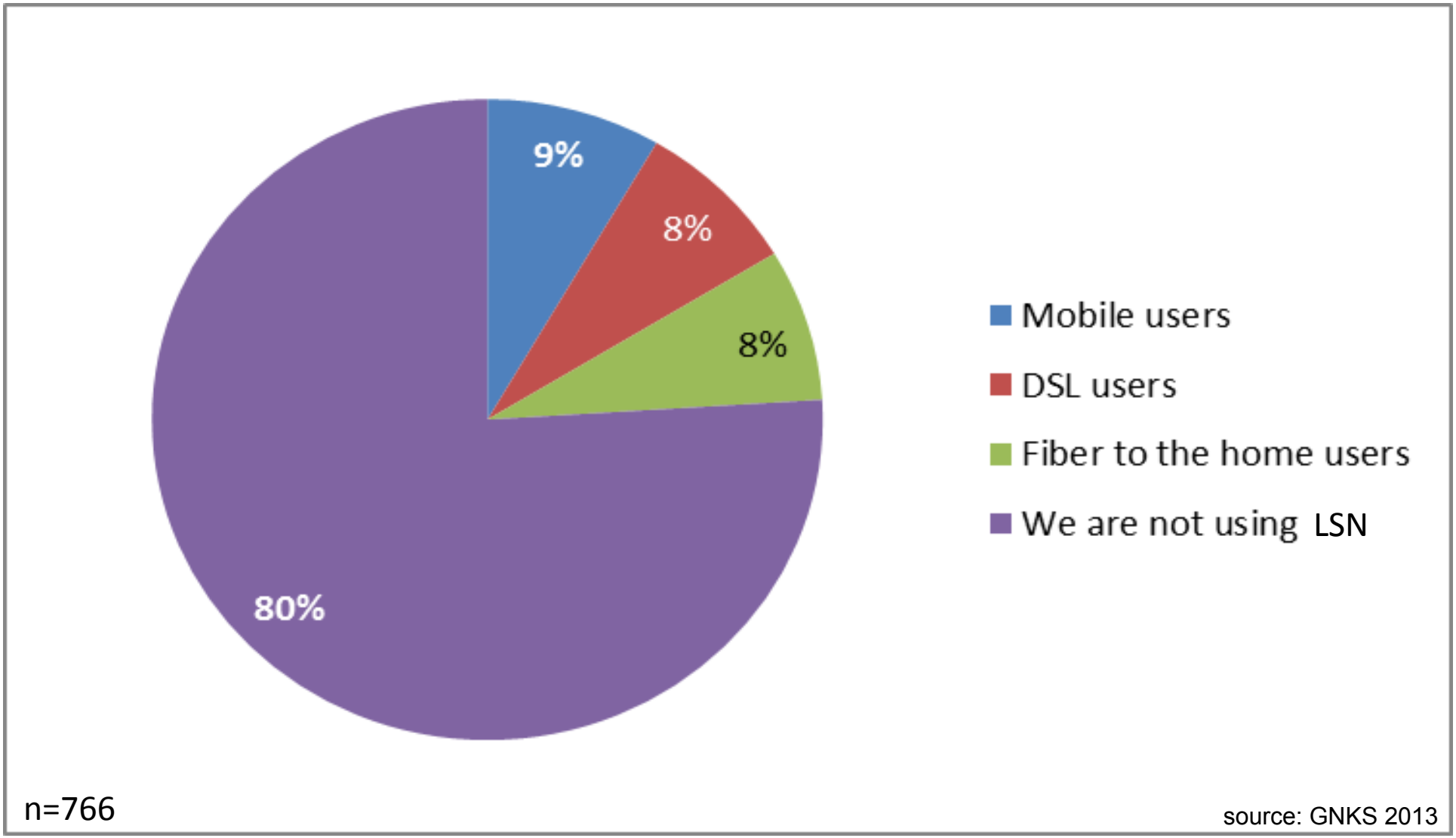
Do you use/plan to use Large Scale NAT (LSN) aka CGN (Carrier Grade NAT) along with or instead of IPv6?



n=182 – those that indicated they plan to use, or use LSN

source: GNKS 2013

If you are using Large Scale NAT (LSN aka CGN), who are you using it for?



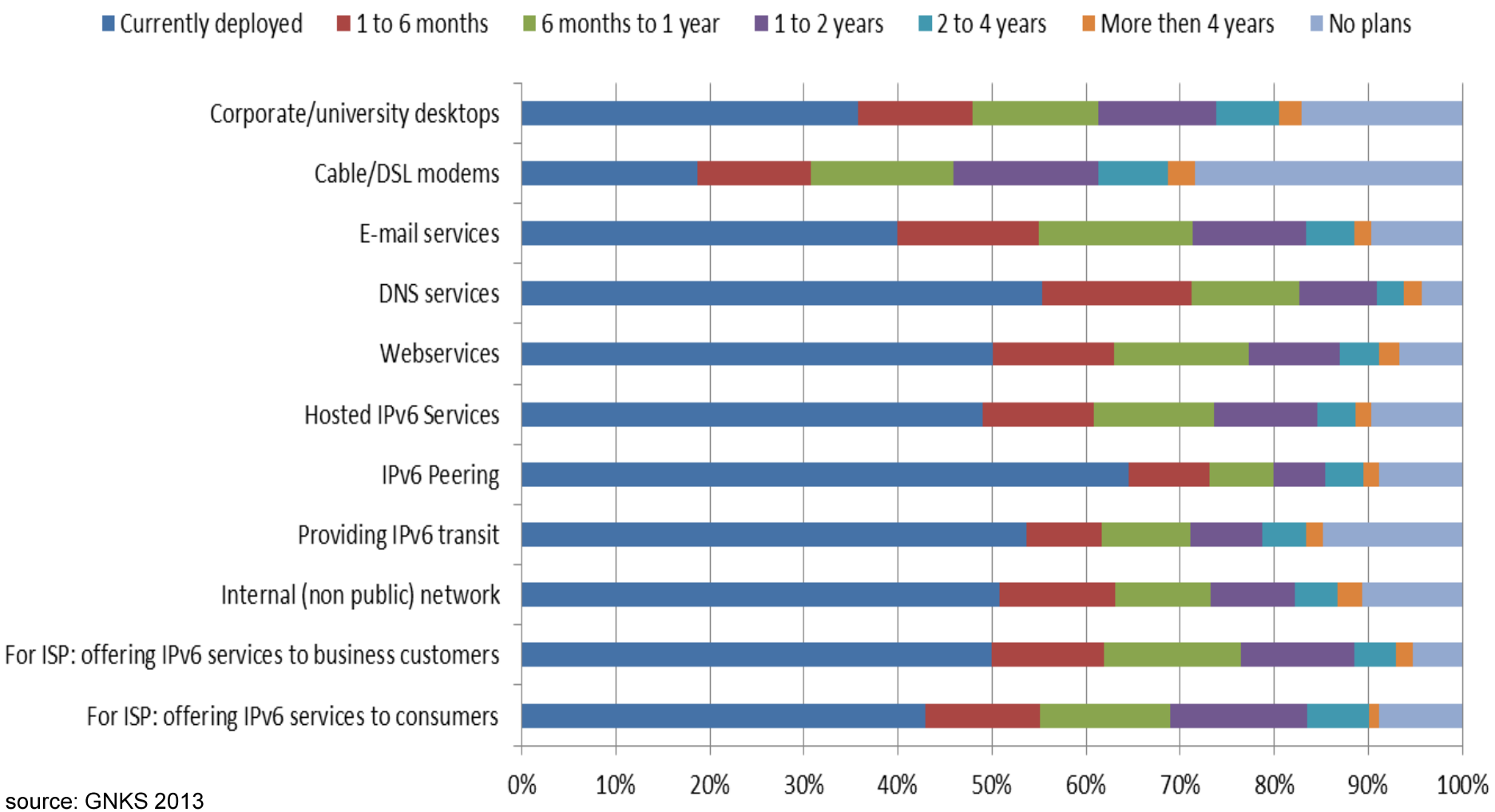
Are there any services which should be offered, or facilitated, by the Regional Internet Registries which would further enable your organizations' adoption of IPv6?

- 337 responses
- 124 a clear "no"
- Top responses:
  - Training
  - Informing governments
  - Stimulating providers to support IPv6

Section 3 - Planning

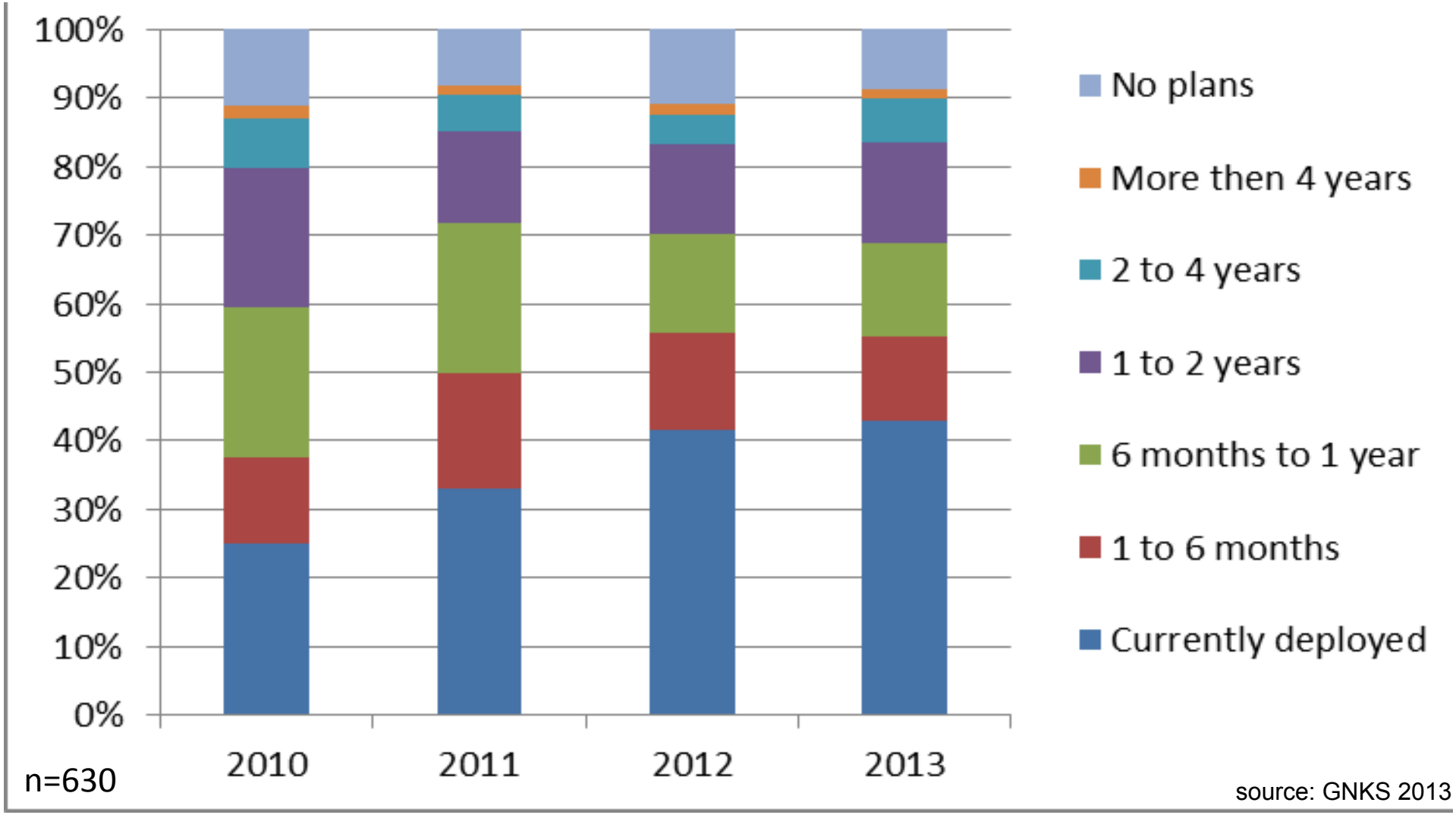
- IPv6 Preparedness among ISPs continues to grow
  - Implementing IPv6 capability
  - Planning for deployment
  - Preparing for increasing demand from customers
- Deployment continues to improve
  - Yet 10% of ISP respondents do not foresee offering IPv6 to consumers within 4 years
  - 6% indicate no plans within 4 years to businesses
- Many are waiting for large scale usage of IPv6 (which is still not happening)

Which best describes your organization's IPv6 implementation (plans)?



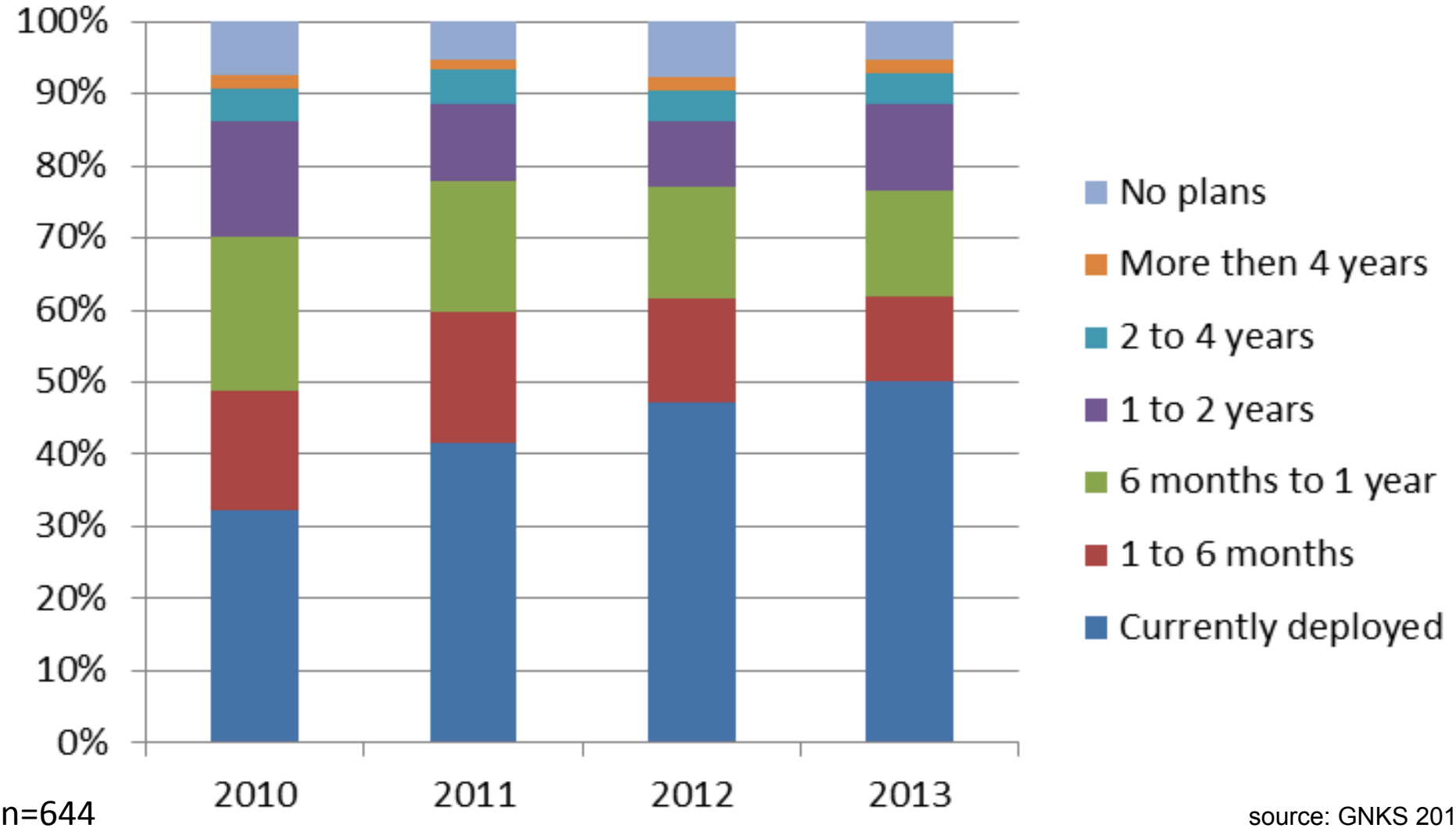
source: GNKS 2013

IPv6 implementation plans for ISPs offering services to consumers



source: GNKS 2013

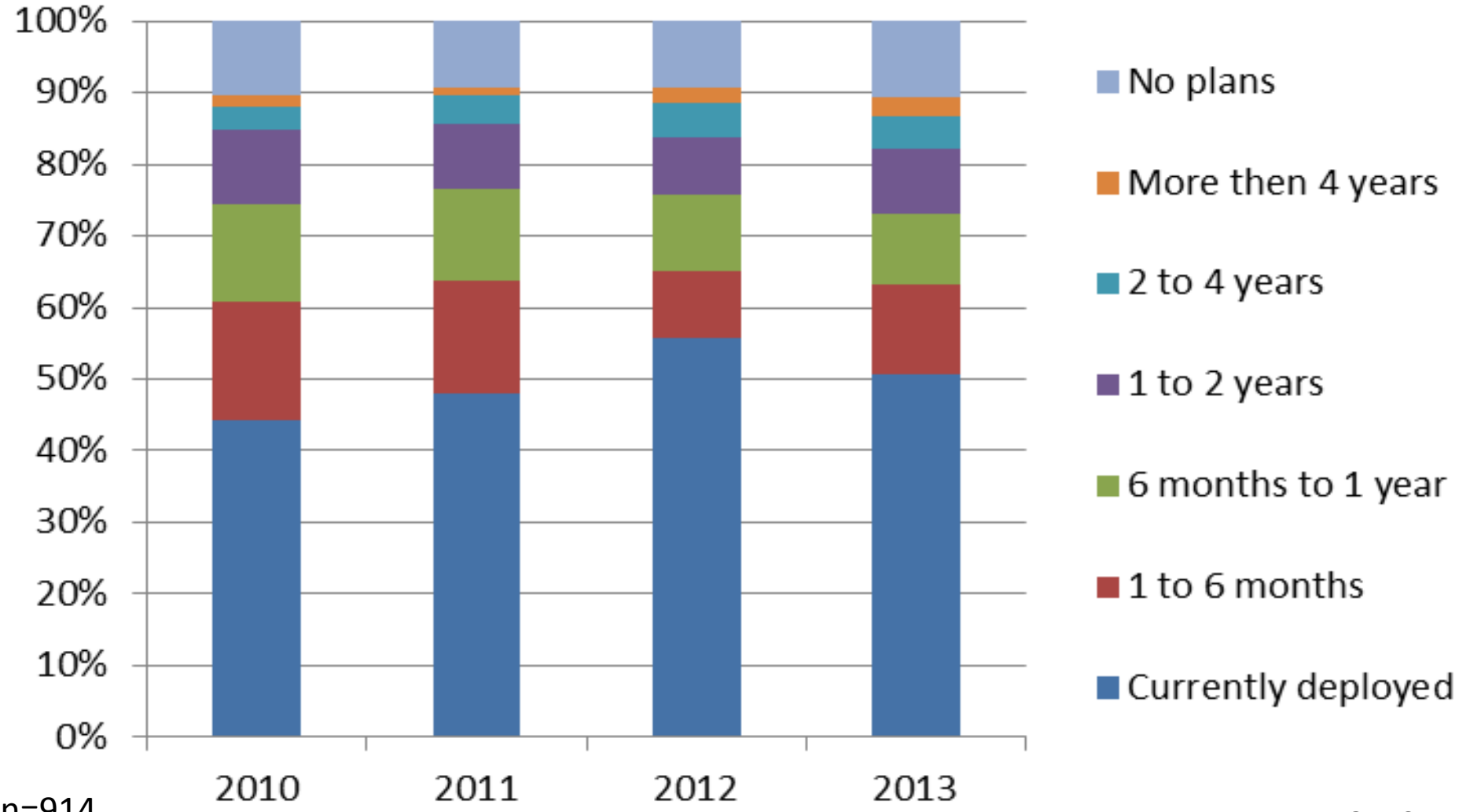
IPv6 implementation plans for ISPs offering services to business customers



n=644

source: GNKS 2013

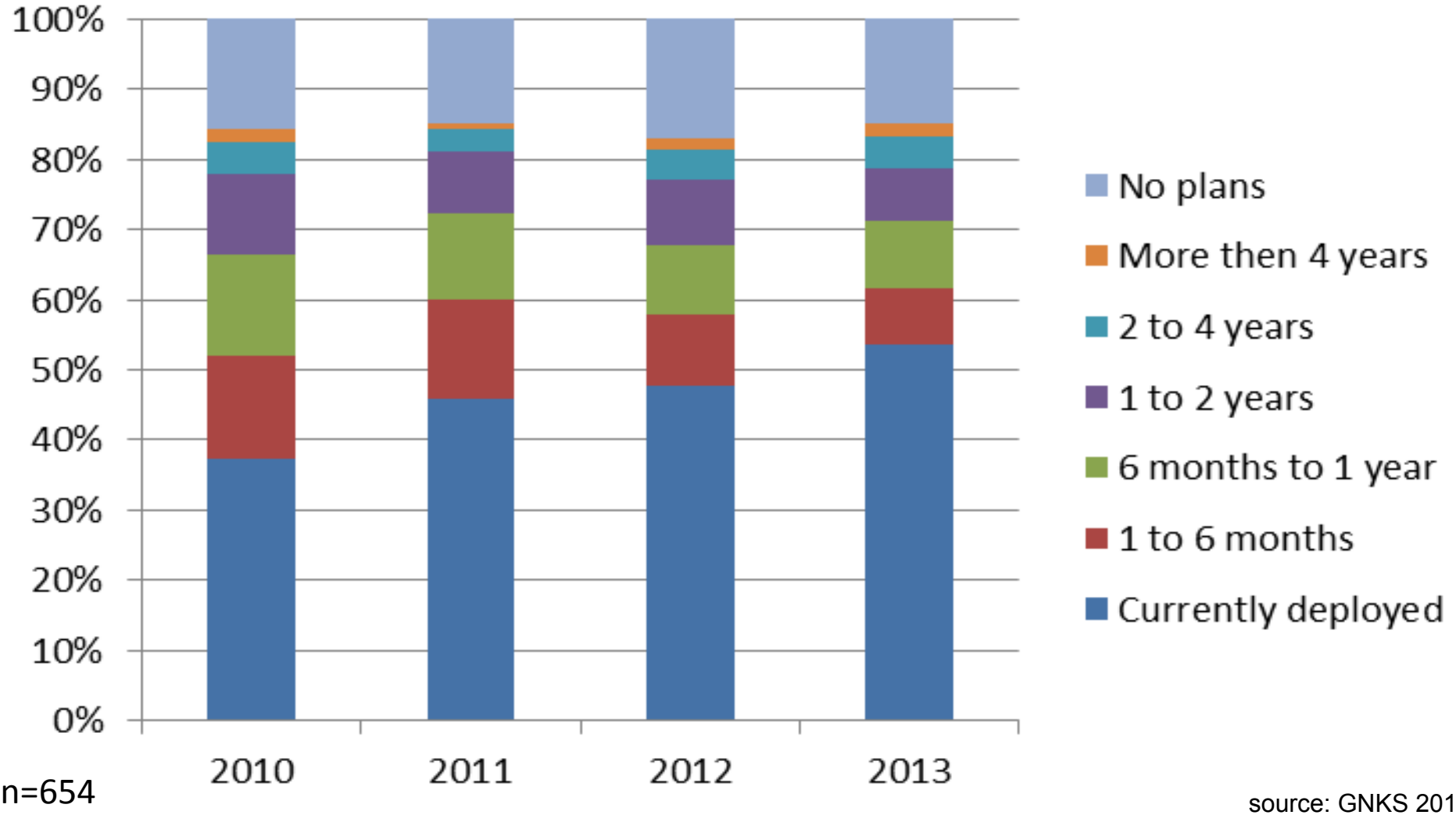
IPv6 implementation plans for Internal (non public) network



n=914

source: GNKS 2013

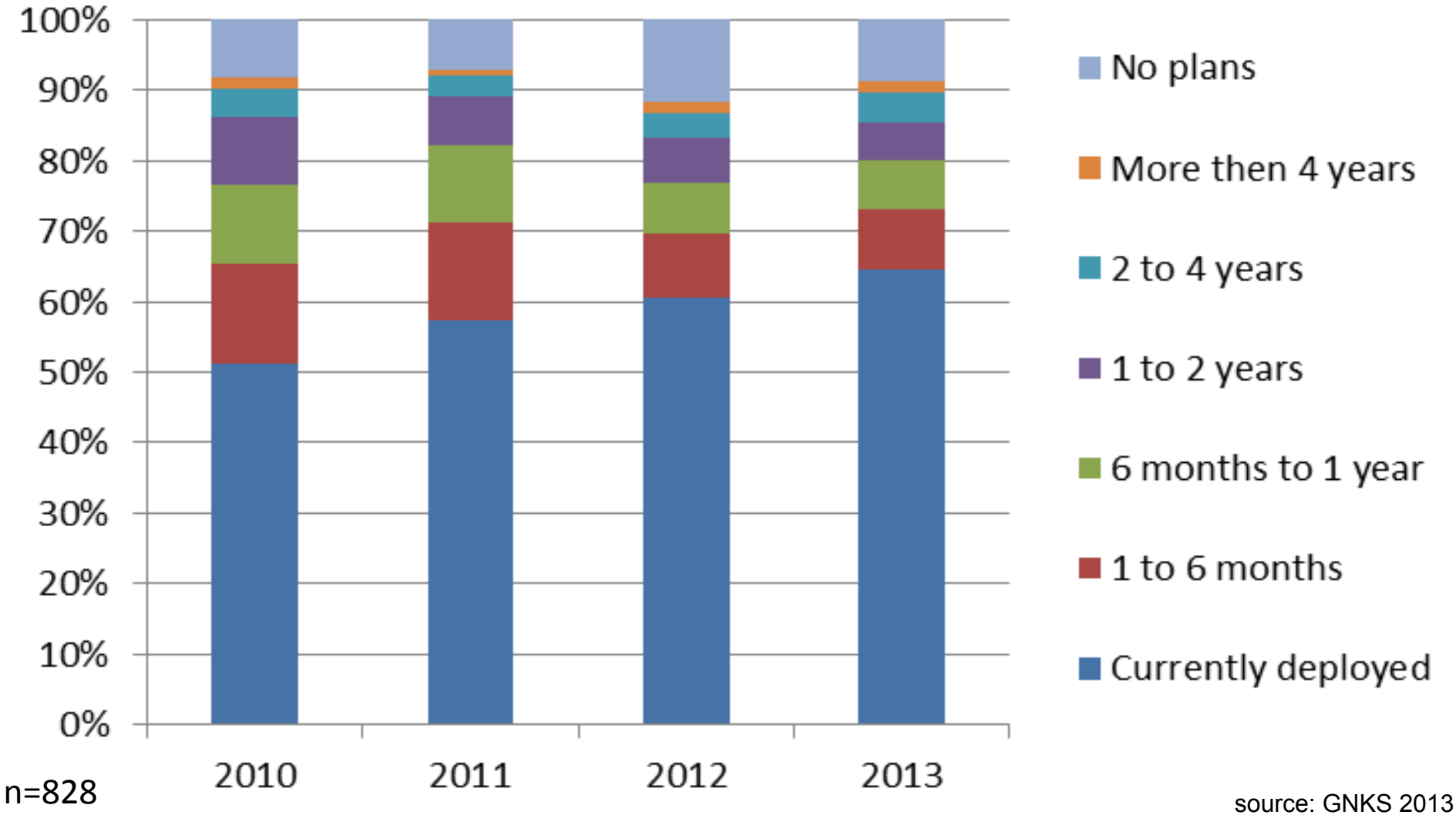
IPv6 implementation plans for providing IPv6 transit



n=654

source: GNKS 2013

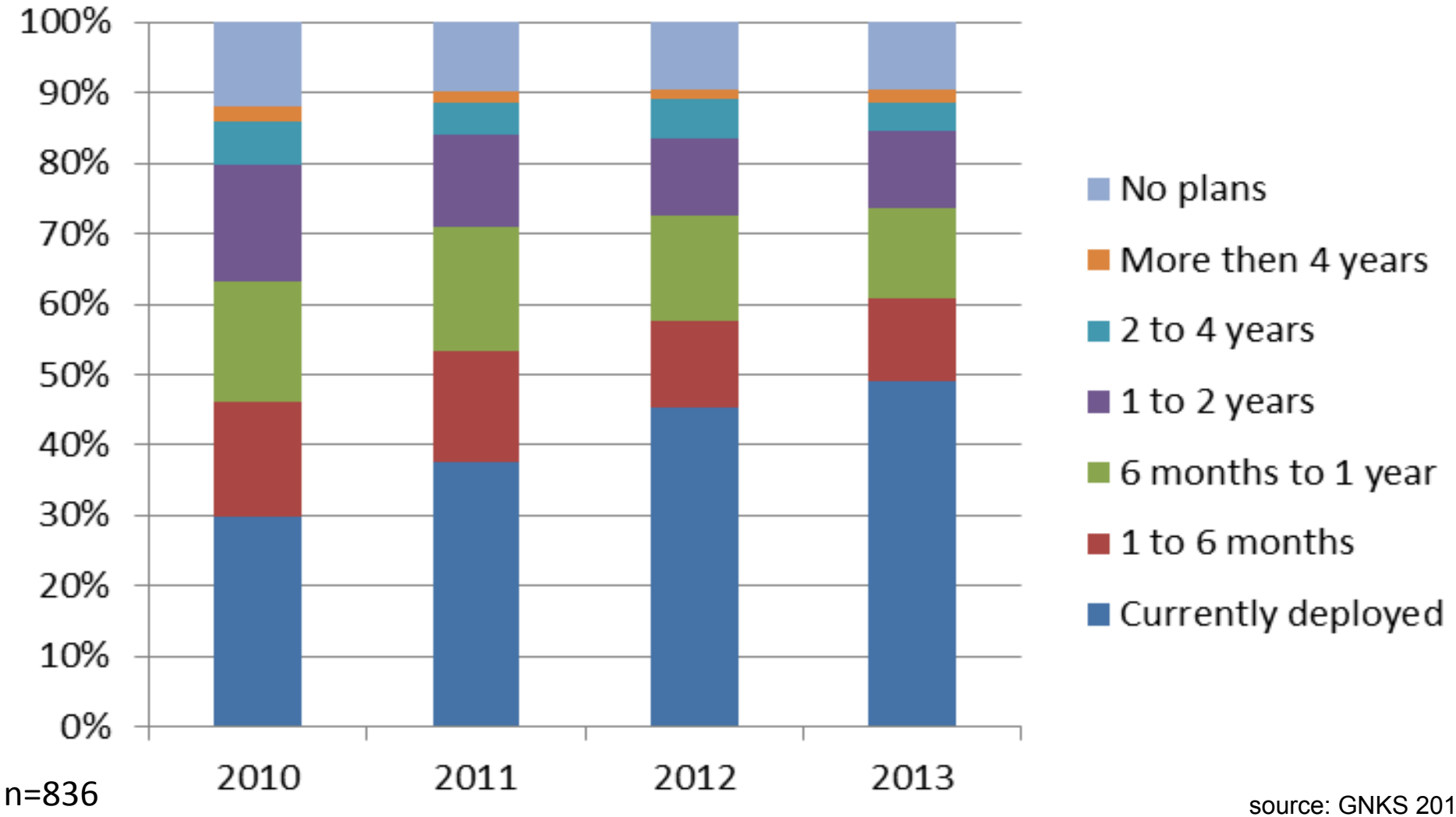
IPv6 implementation plans for IPv6 peering



n=828

source: GNKS 2013

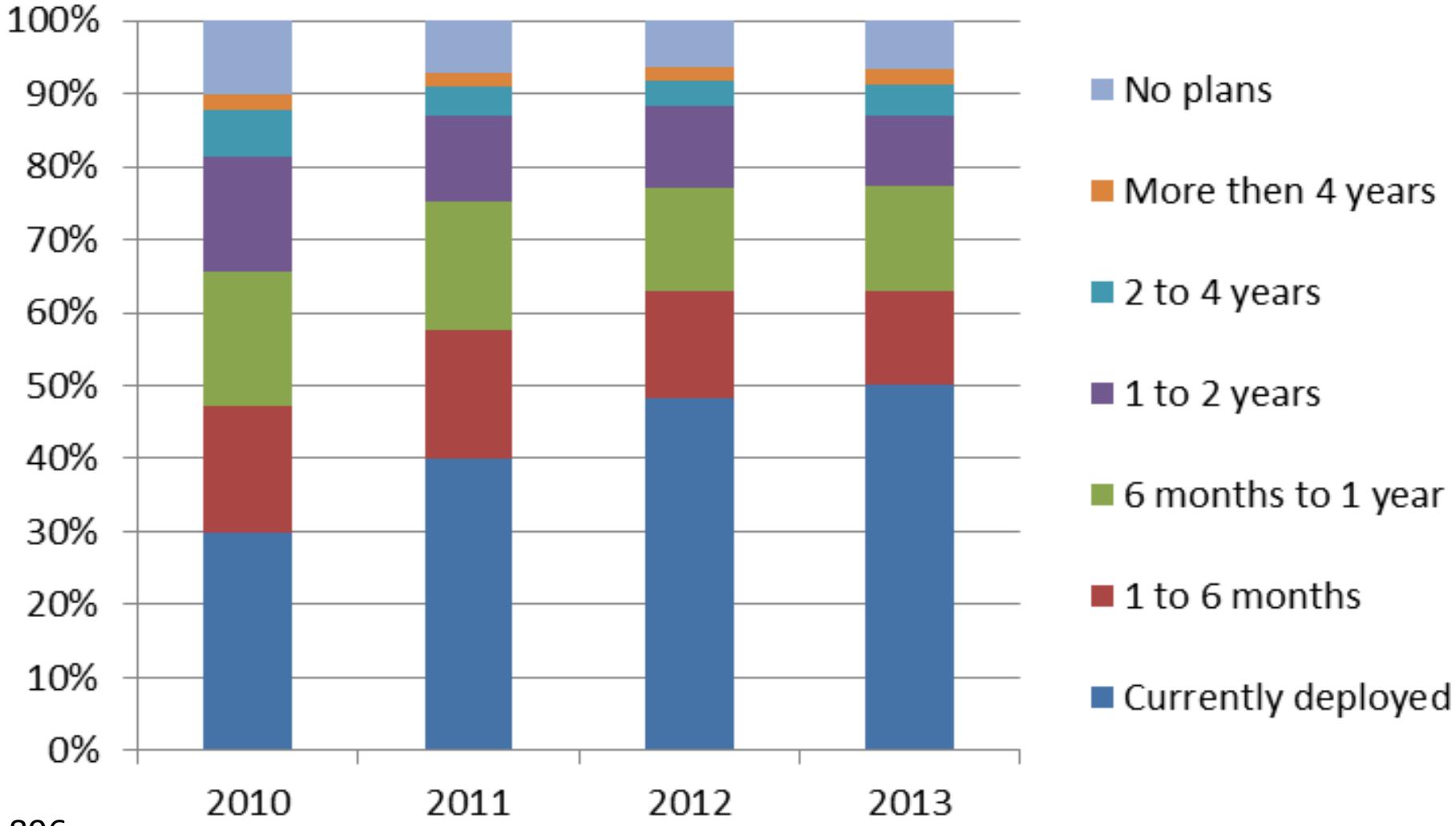
IPv6 implementation plans for hosted IPv6 services



n=836

source: GNKS 2013

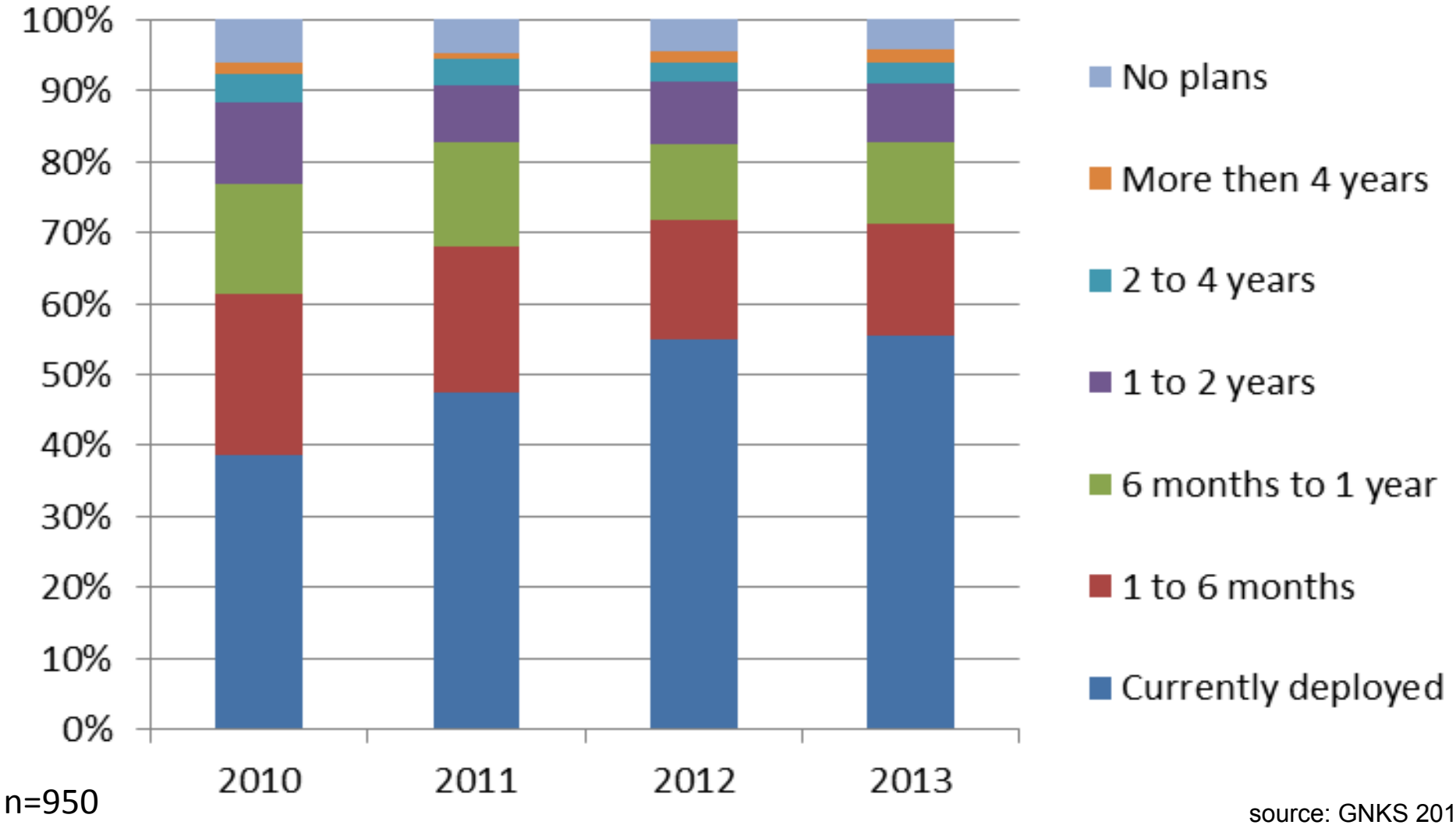
IPv6 implementation plans for web services



n=896

source: GNKS 2013

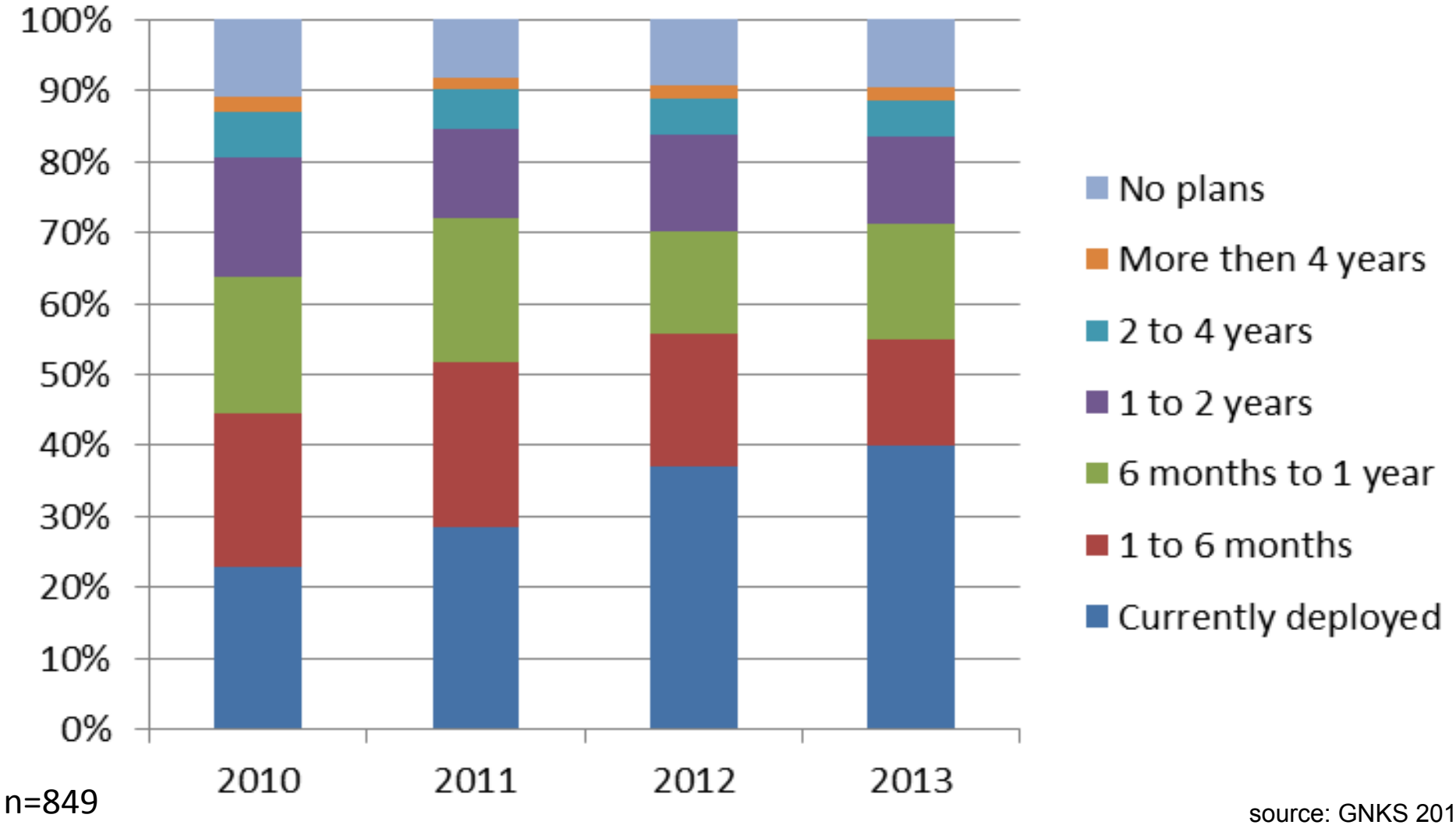
IPv6 implementation plans for DNS services



n=950

source: GNKS 2013

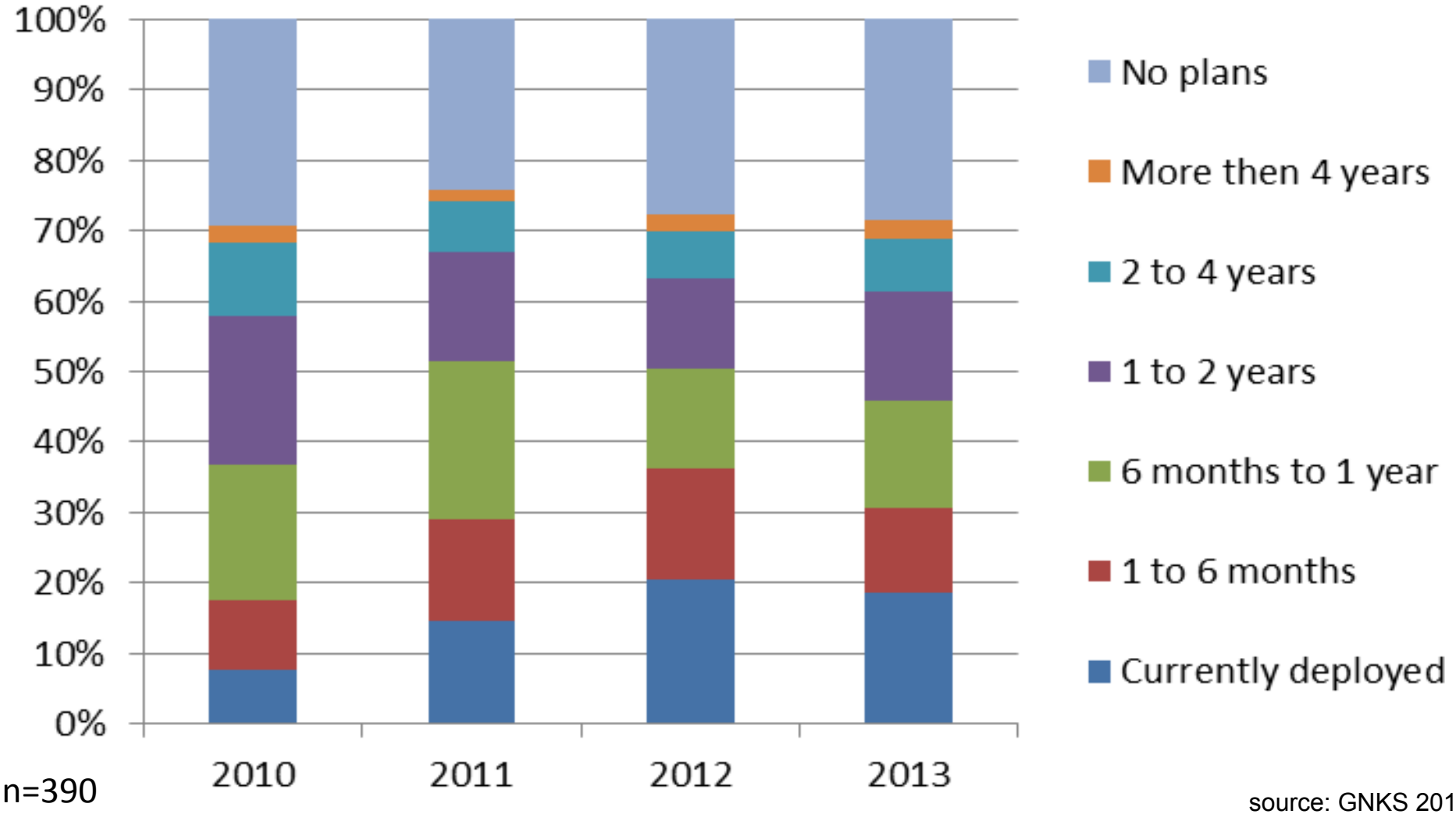
IPv6 implementation plans for email services



n=849

source: GNKS 2013

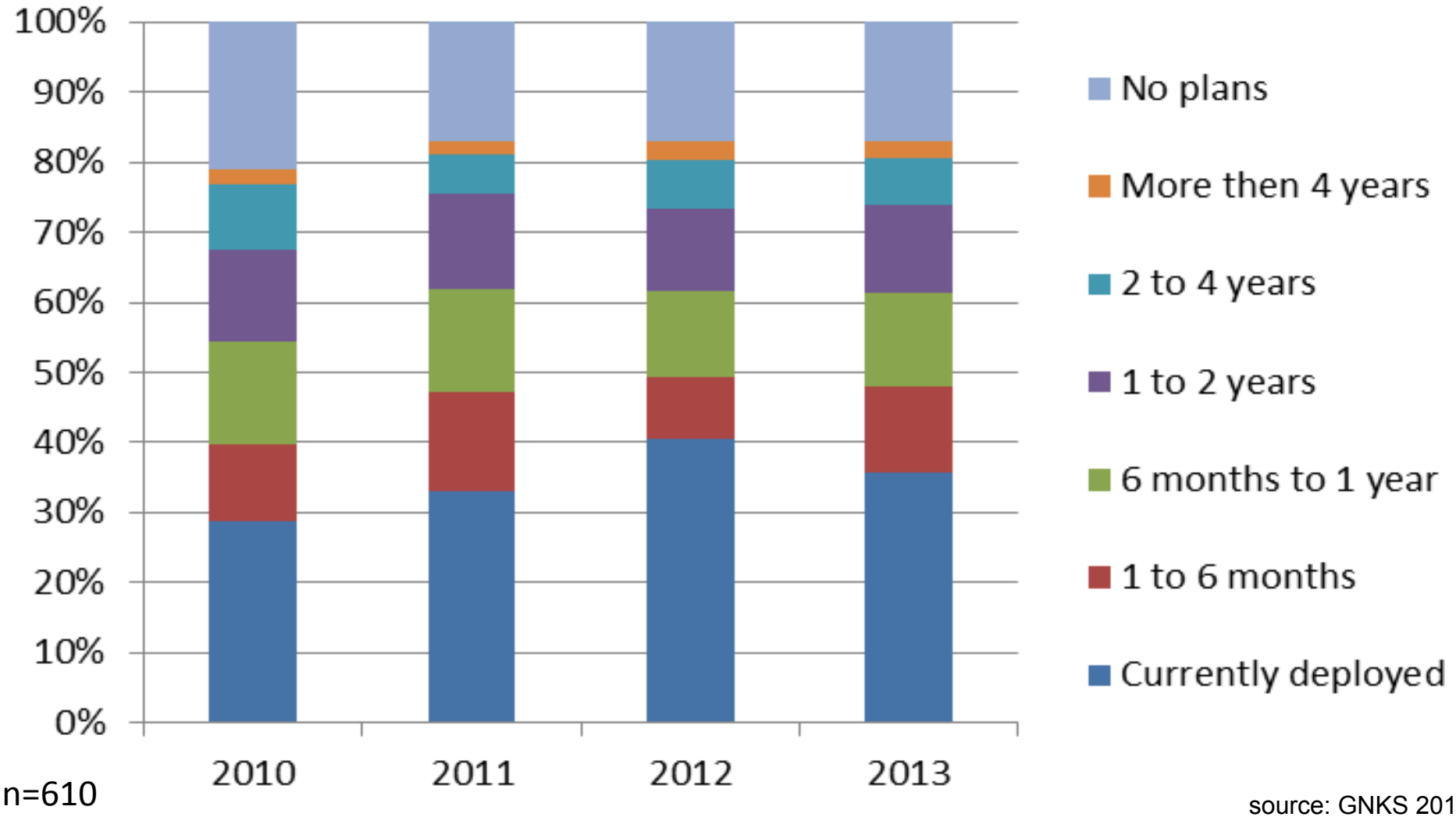
IPv6 implementation plans for cable/DSL modems



n=390

source: GNKS 2013

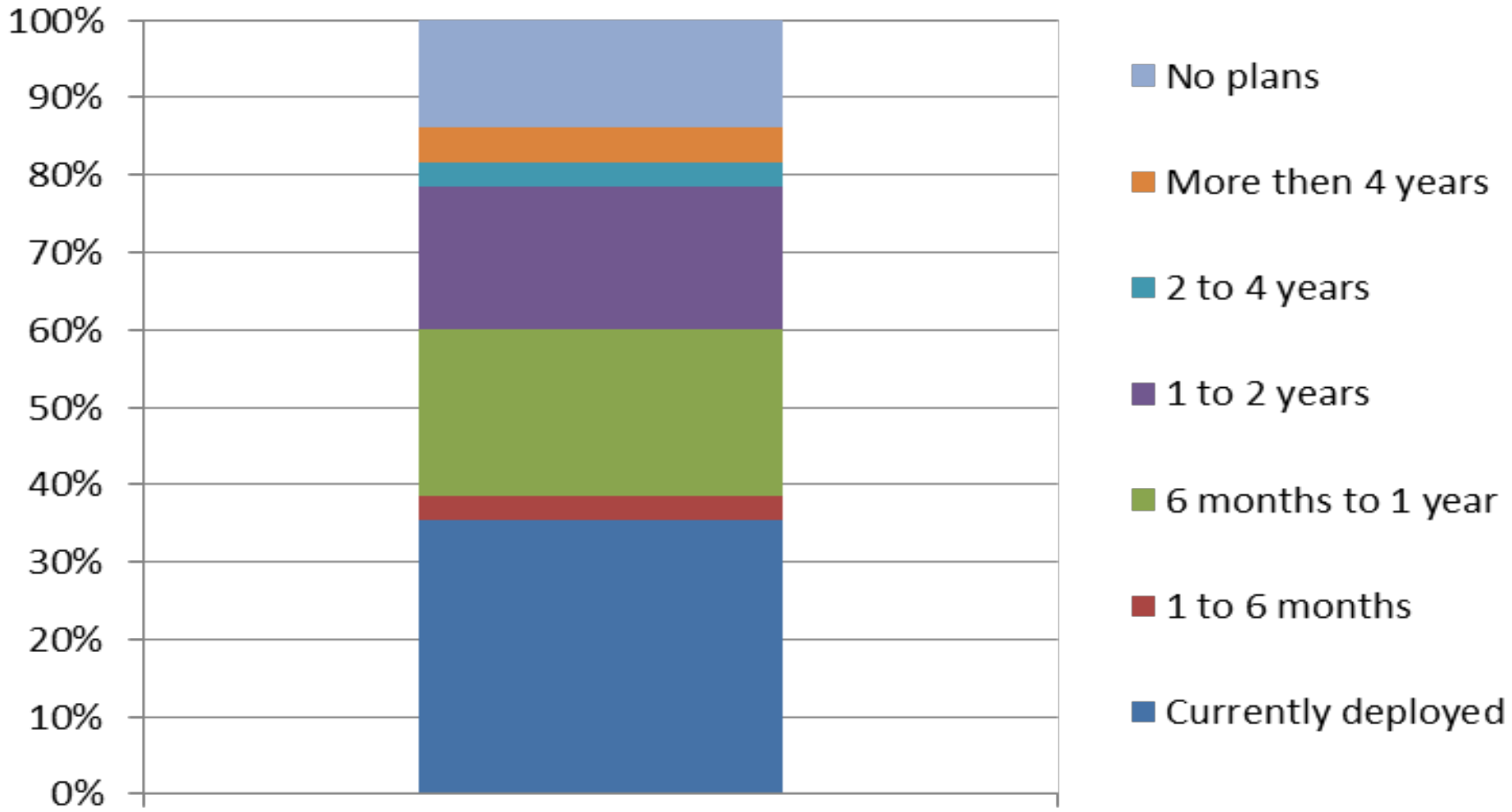
IPv6 implementation plans for corporate/university desktops



n=610

source: GNKS 2013

Which best describes your organization's LTE and IPv6 implementation (plans)?



Only mobile operators, - n=71

source: GNKS 2013

High level conclusion

- Preparedness for IPv6 deployment continues to increase
  - Generally at high levels
    - Almost half of ISP respondents offer IPv6 to their customers
    - More than 80% will do so within 2 years
- More ISPs are now experiencing more significant usage by their clients
  - 31% experience more than 0.5% usage
- Carrier Grade NAT is generally not used as a solution to replace IPv6
  - 18% of respondents use, or plan to use CGN but more than 70% of those use it along with IPv6 (not instead of)

High level conclusion

- *While a small minority is still banking on their stock of IPv4 addresses for the years to come, most recognize the importance of transitioning to IPv6.*
- *As many are ready with initial preparations and are now waiting for a large scale IPv6 deployment and implementation, large scale deployment pilots would be a prudent way forward.*

An initiative funded by the European Commission (2012-2013), http://www.ipv6observatory.eu, and supported by the NRO, http://www.nro.net/ipv6

We thank all respondents for their contributions !

When asked if they'd be interested in participating in this survey again in a years' time 93% of respondents said

"Yes"

For more information: maarten@gnksconsult.com