



PROCESS CONTROL SYSTEMS FORUM

*Collaborating to Advance
Control System Security*

Summary of Findings from the Newton-Evans Study on Wi-Fi Communications in Electric Utilities Conducted for CIGRE B5 WG22

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Background of the CIGRE Survey of Wireless Communications Use for Substation Protection and Automation

- **Convener of CIGRE B5, WG 22 requested assistance of Newton-Evans Research to Conduct an International Survey of Wireless Usage Patterns Among Electric Utilities.**
- **Survey prepared and sent to utilities around the world.**
- **By May, 2006, 83 surveys from 32 countries had been received, validated, and tabulated.**
- **Following are the results of the study in graphic format.**

Figure 1a. Usage and Plans of Wireless LAN Based on IEEE 802.11 for substation communications inside the fence

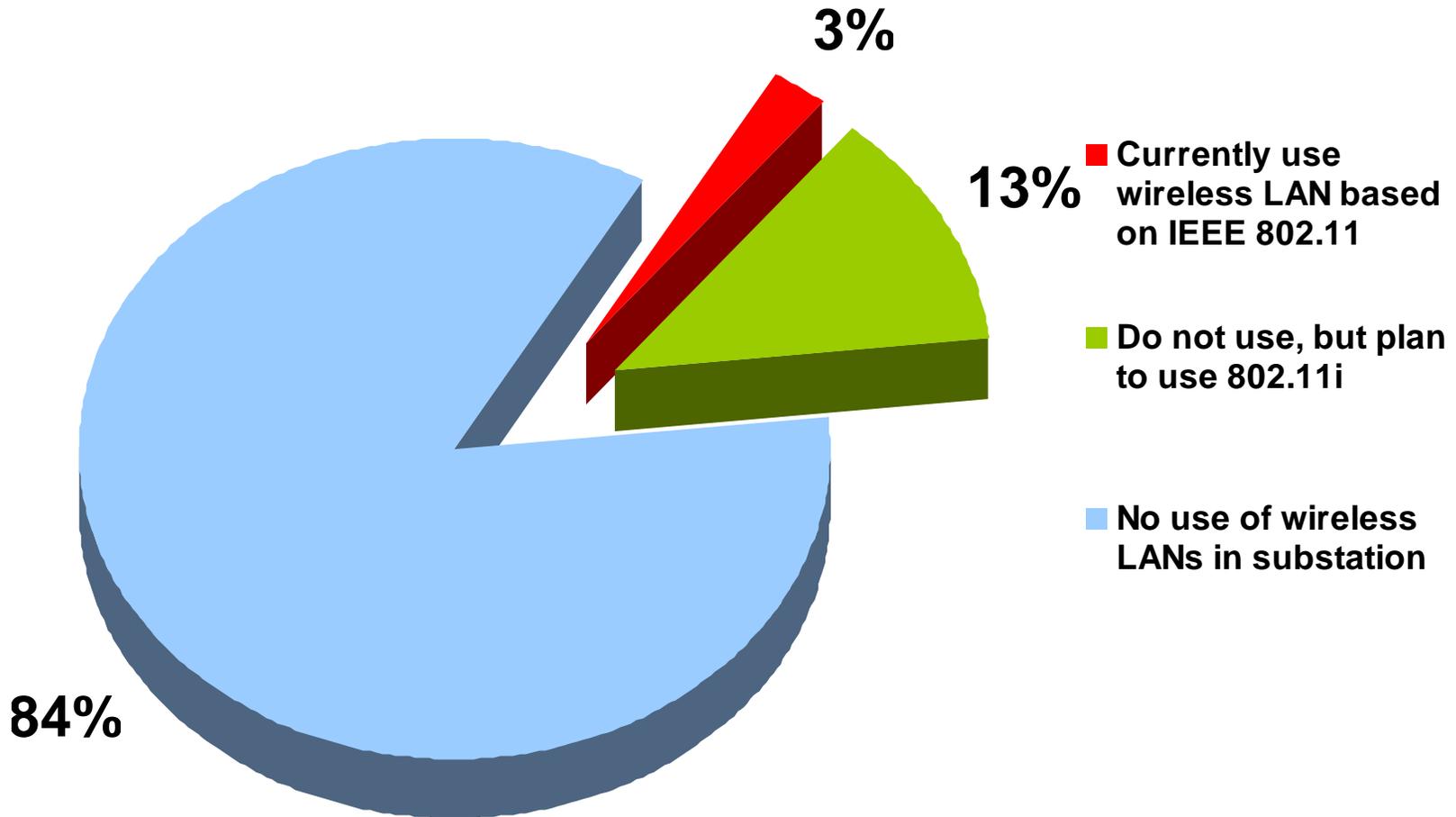


Figure 1b. Usage and Plans of Wireless LAN Based on IEEE 802.11 for substation communications inside the fence

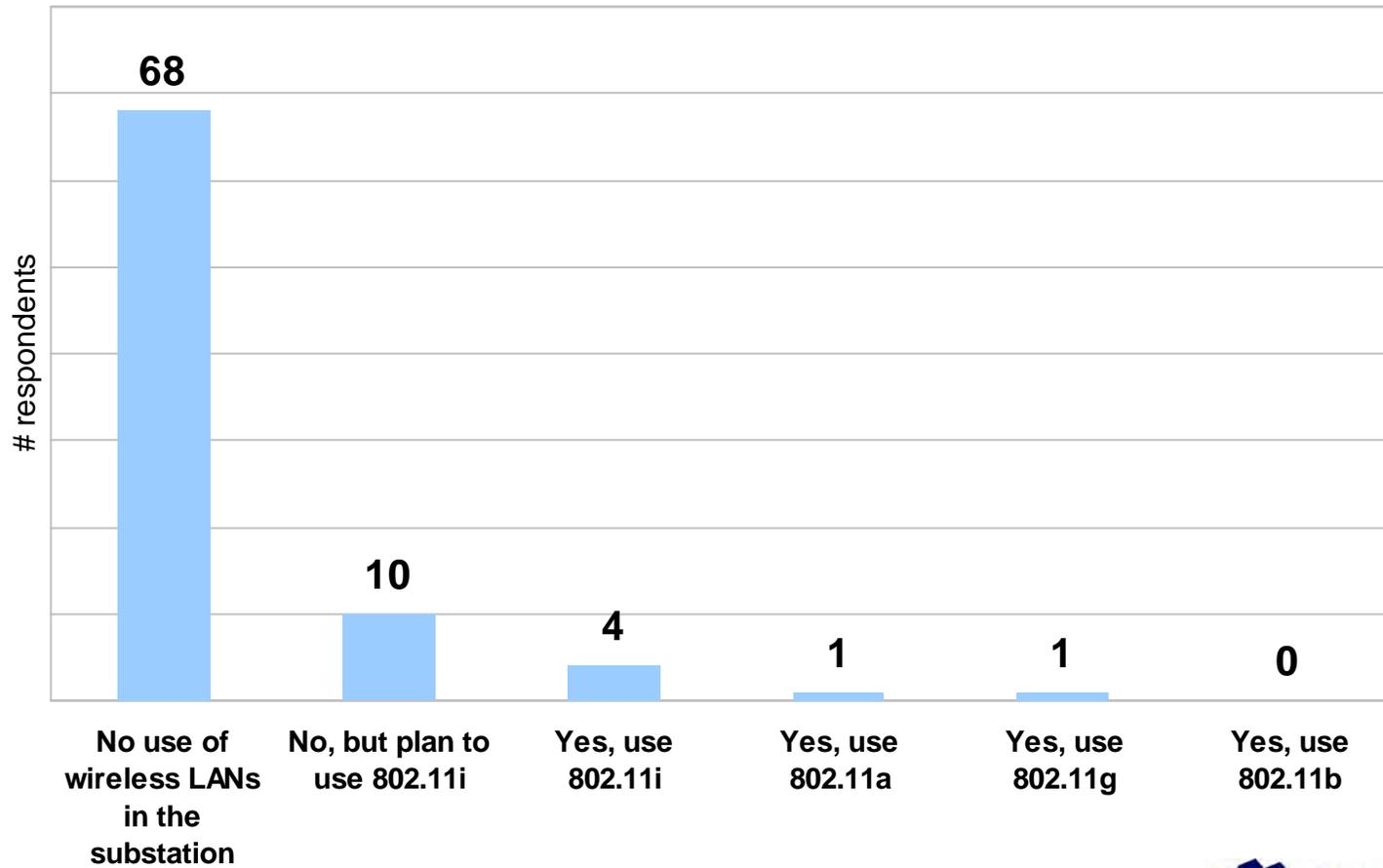


Figure 2a. **Do security issues have an effect on the decision not to use wireless communications in the substation?**

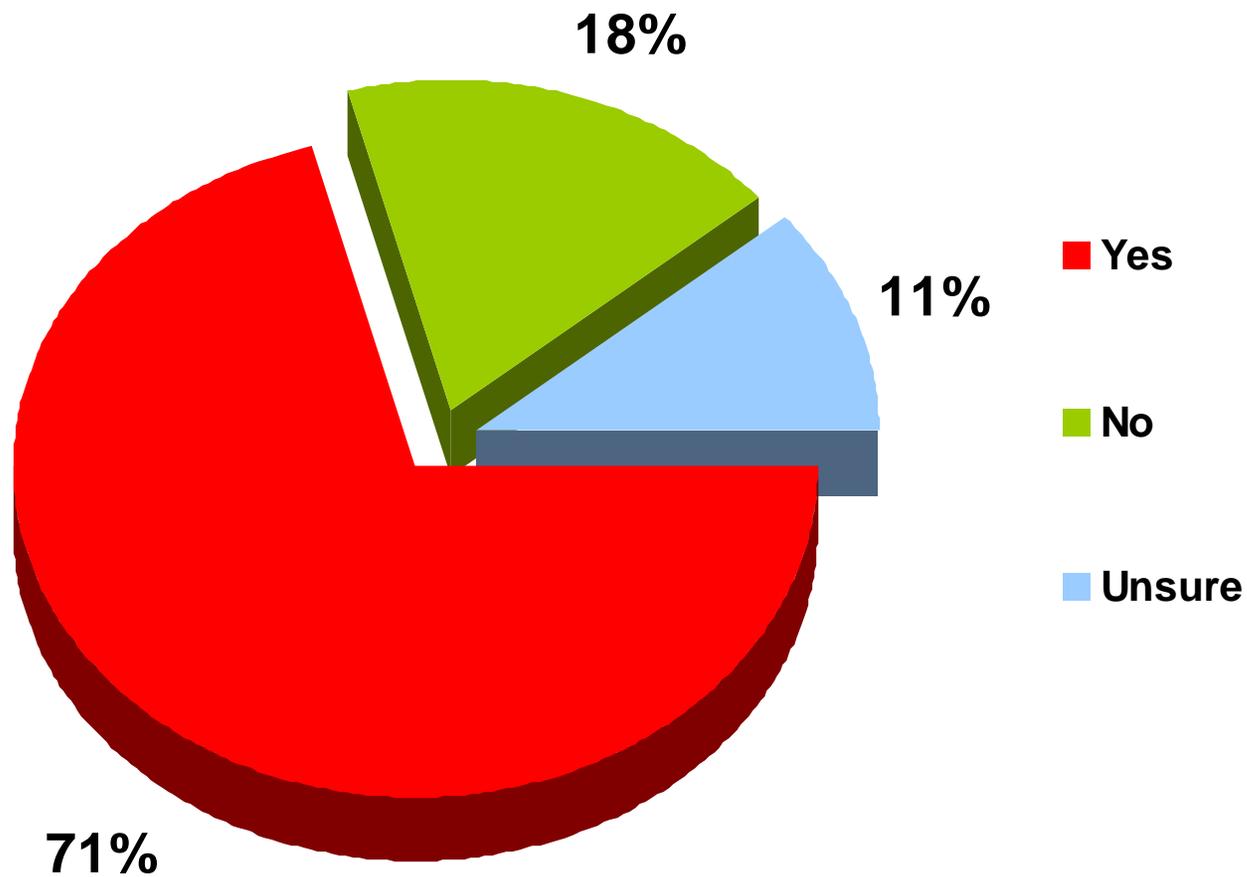


Figure 2b. **Do security issues have an effect on the decision not to use wireless communications in the substation?**

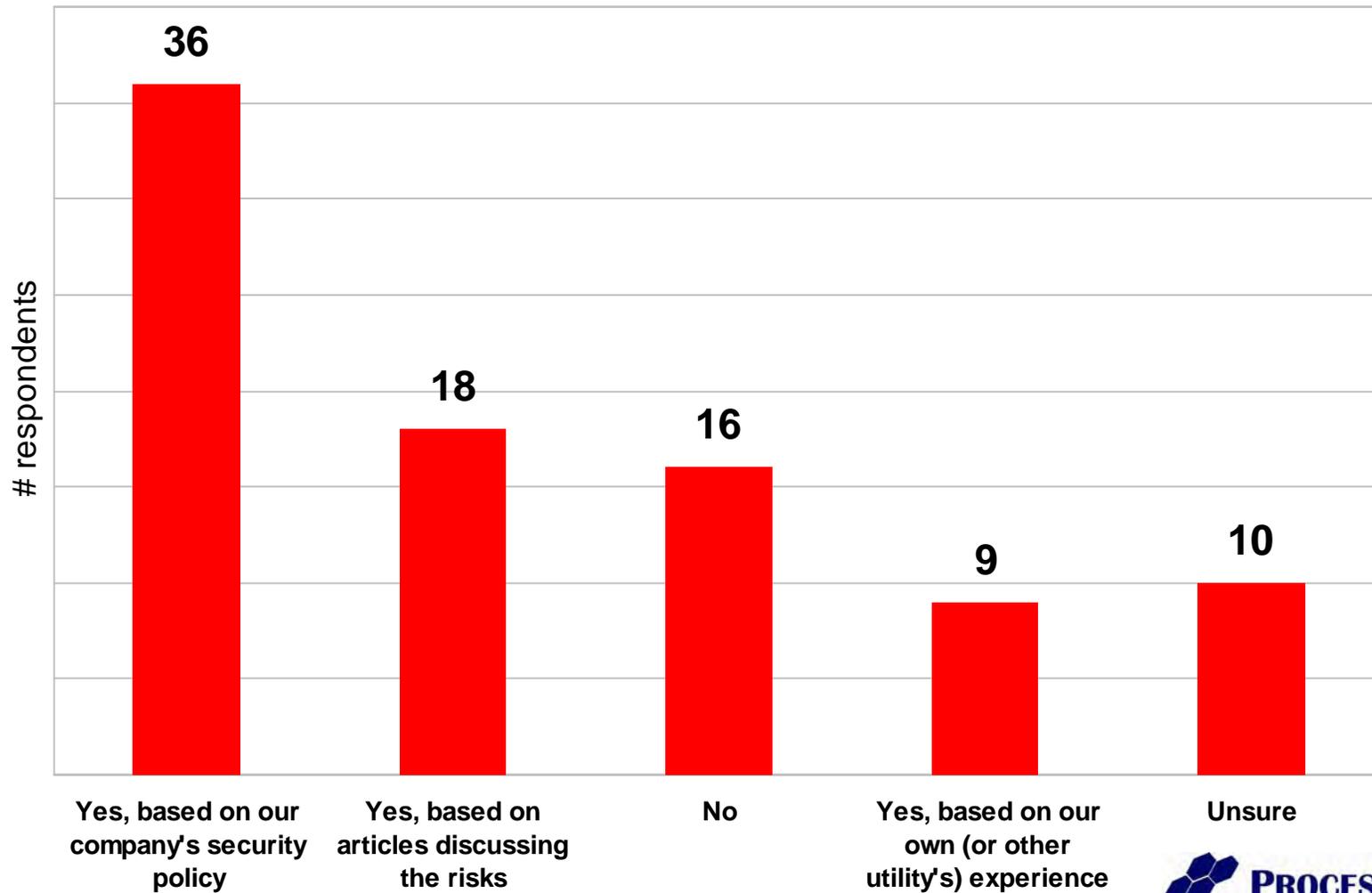


Figure 3a. **Do you feel that your utility could benefit by having the capability to get intelligent electronic device (IED) technical support at any time and regardless of the location?**

(e.g., a relay engineer is traveling with only wireless access to his/her notebook computer)

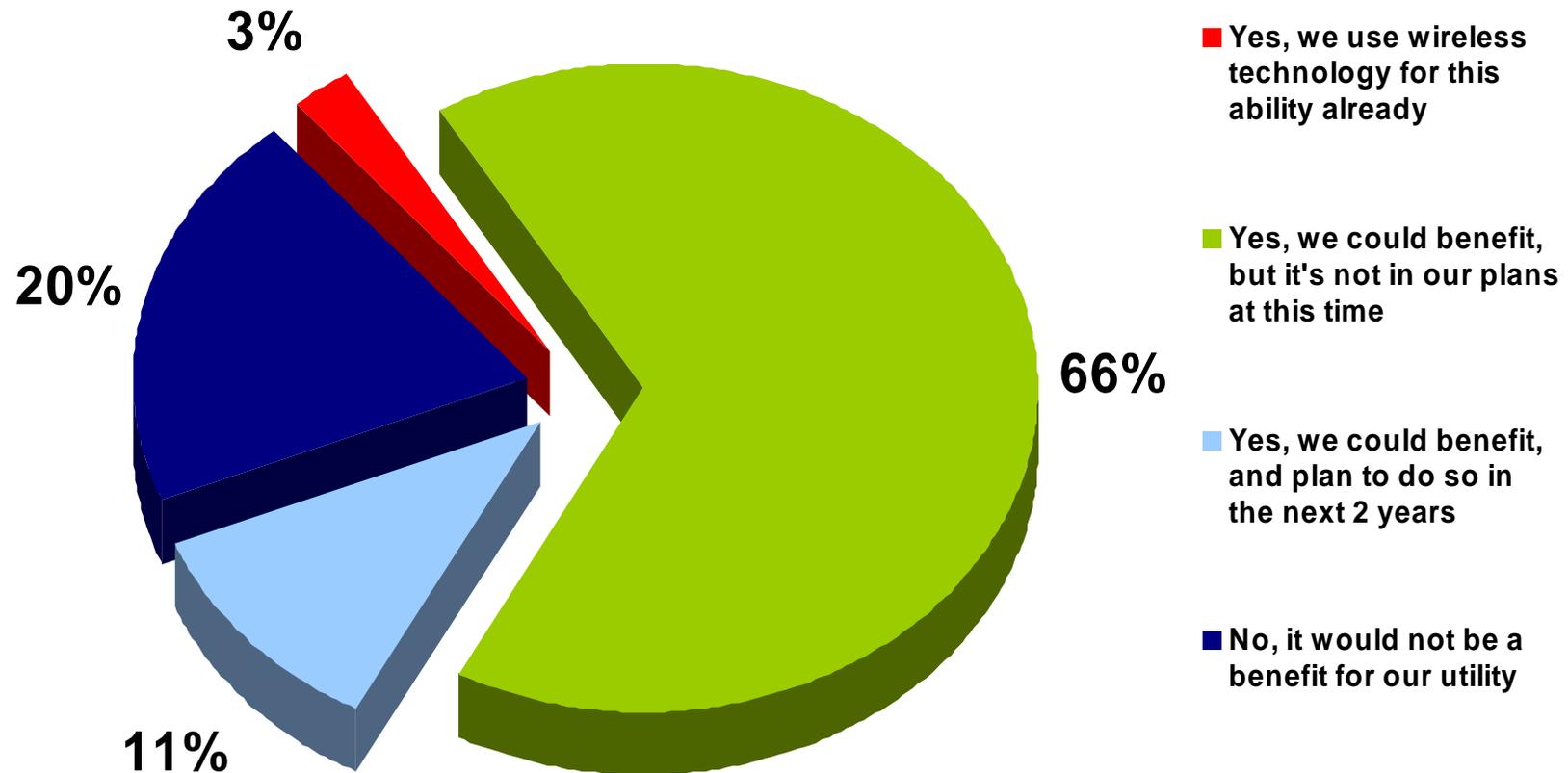


Figure 3b. Do you feel that your utility could benefit by having the capability to get intelligent electronic device (IED) technical support at any time and regardless of the location?

(e.g., a relay engineer is traveling with only wireless access to his/her notebook computer)

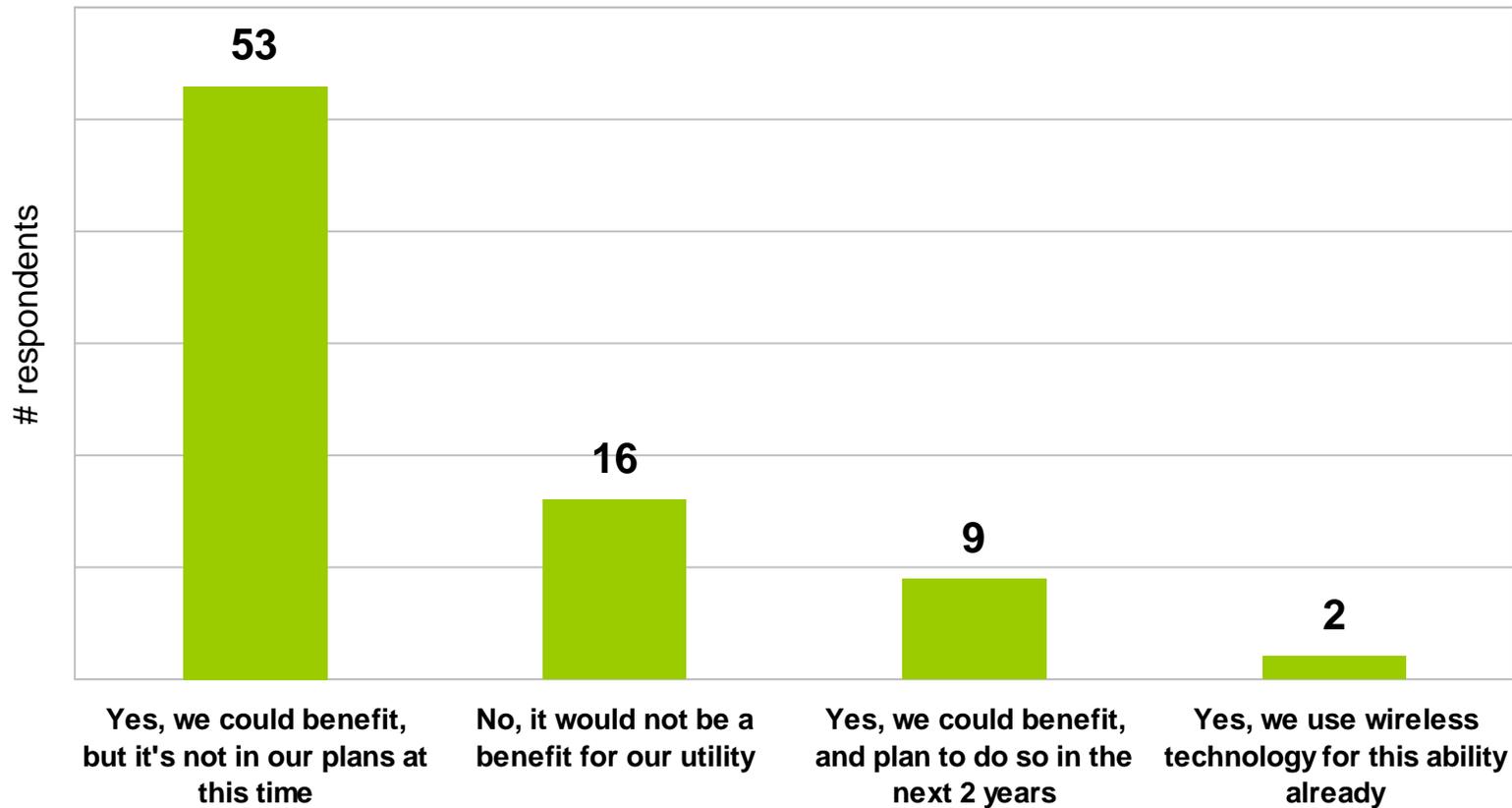


Figure 4. **Need for local access to substation IED's without entering the substation**

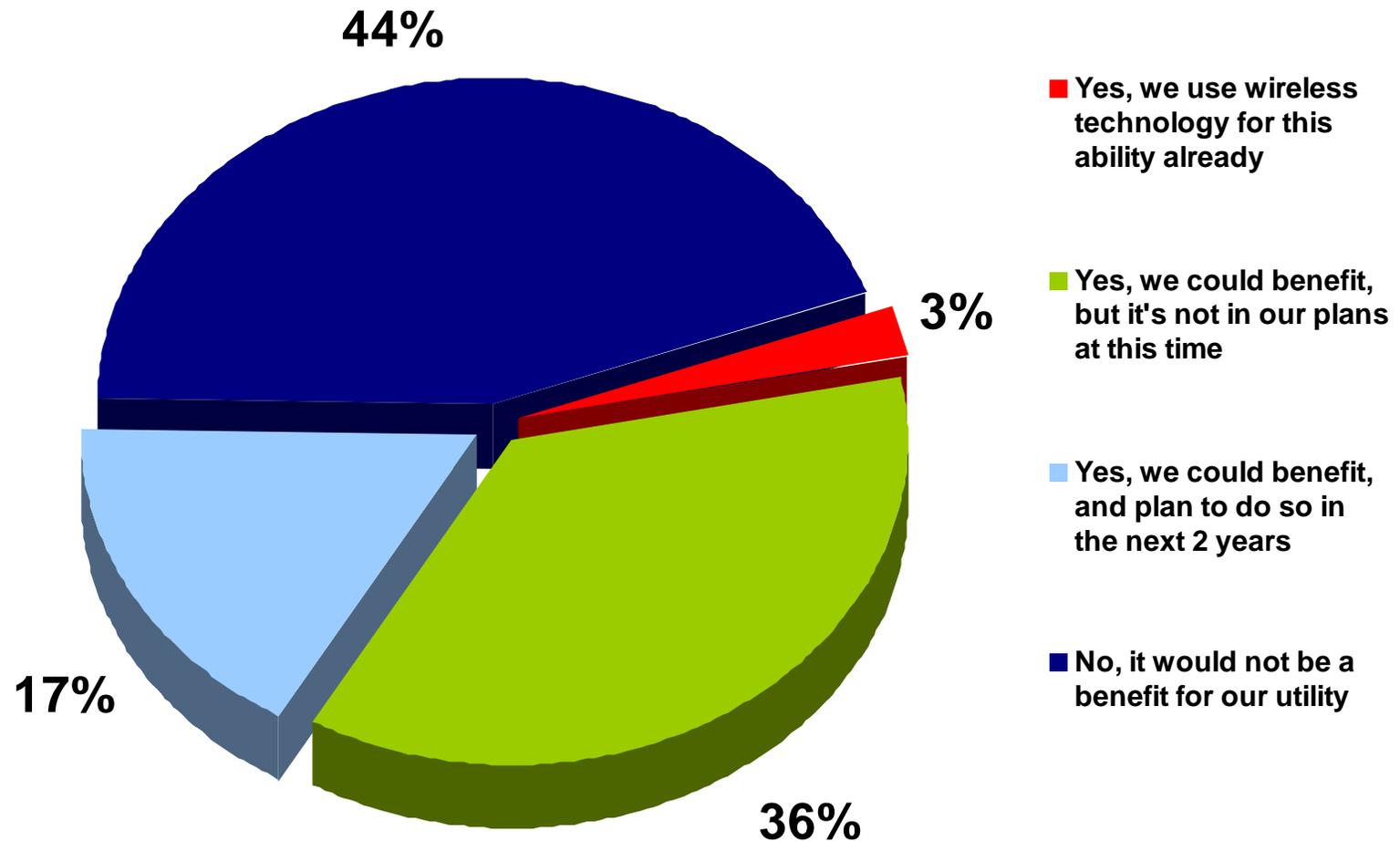


Figure 5a. **Need for local access to IED's that are difficult to reach because of terrain or environmental conditions**

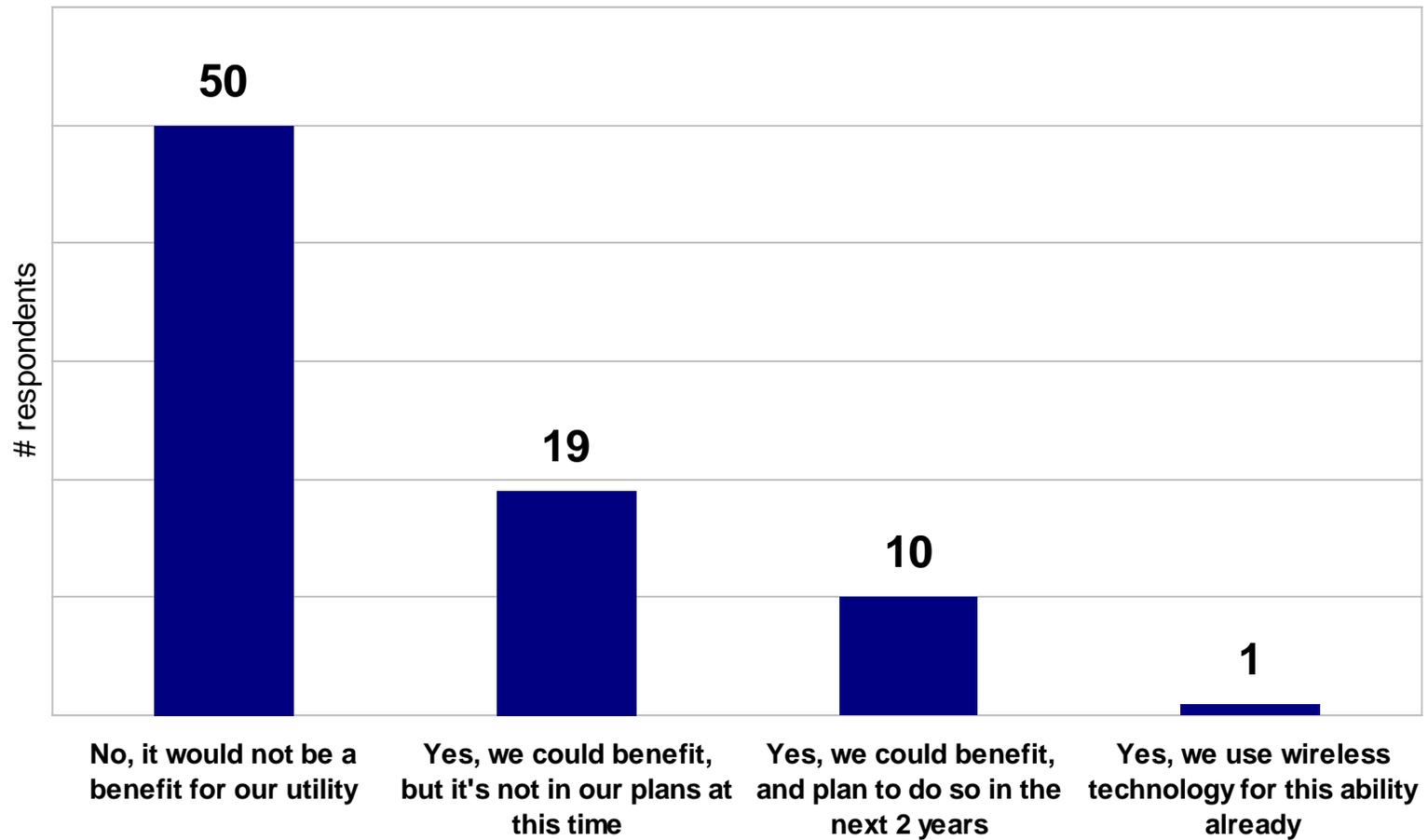


Figure 5b. Is there a need for local access to IEDs that are difficult to reach because of terrain or environmental conditions?

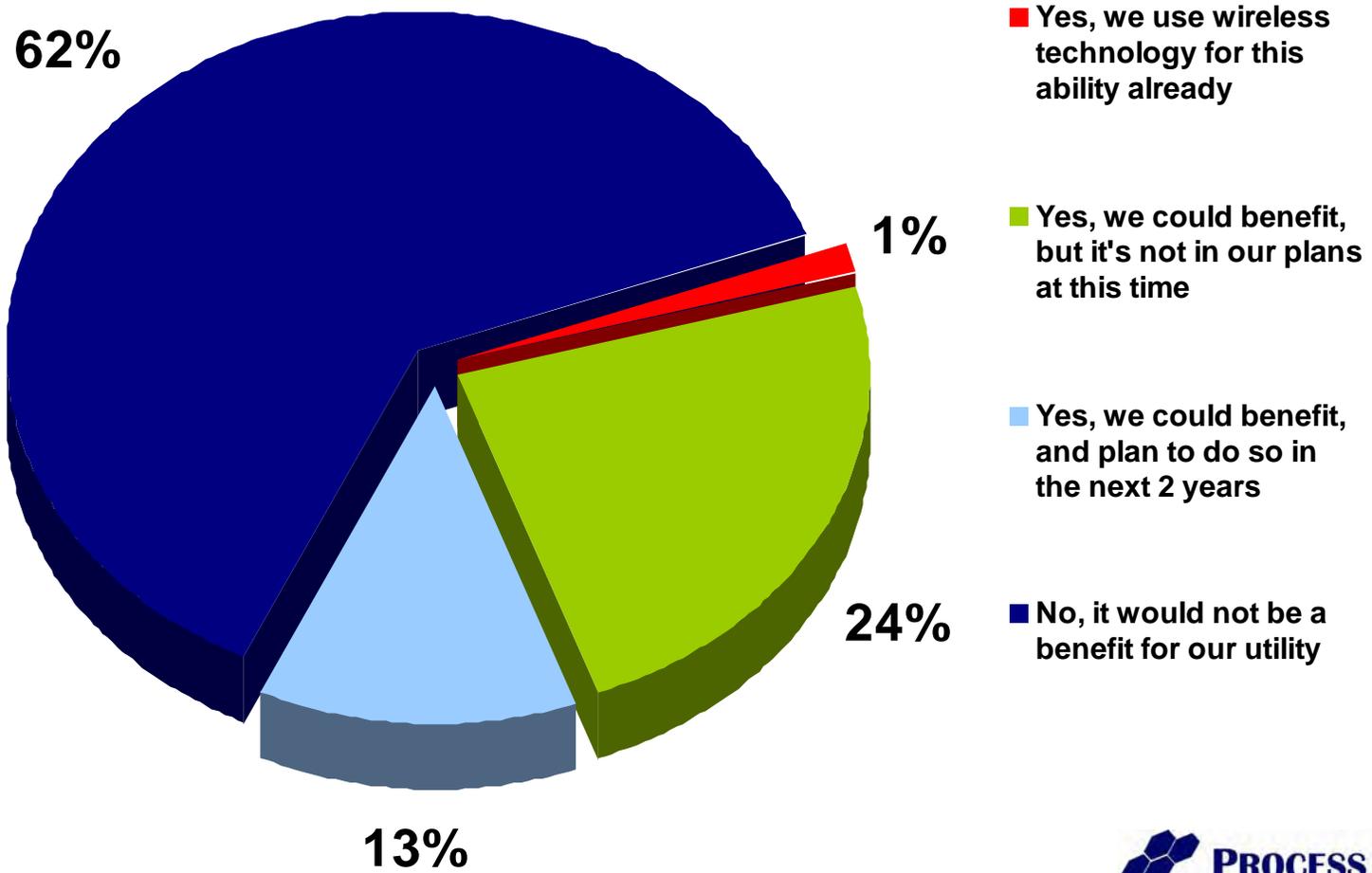


Figure 6. **Concerns about possible security risks in using wireless communications for mission critical tasks**

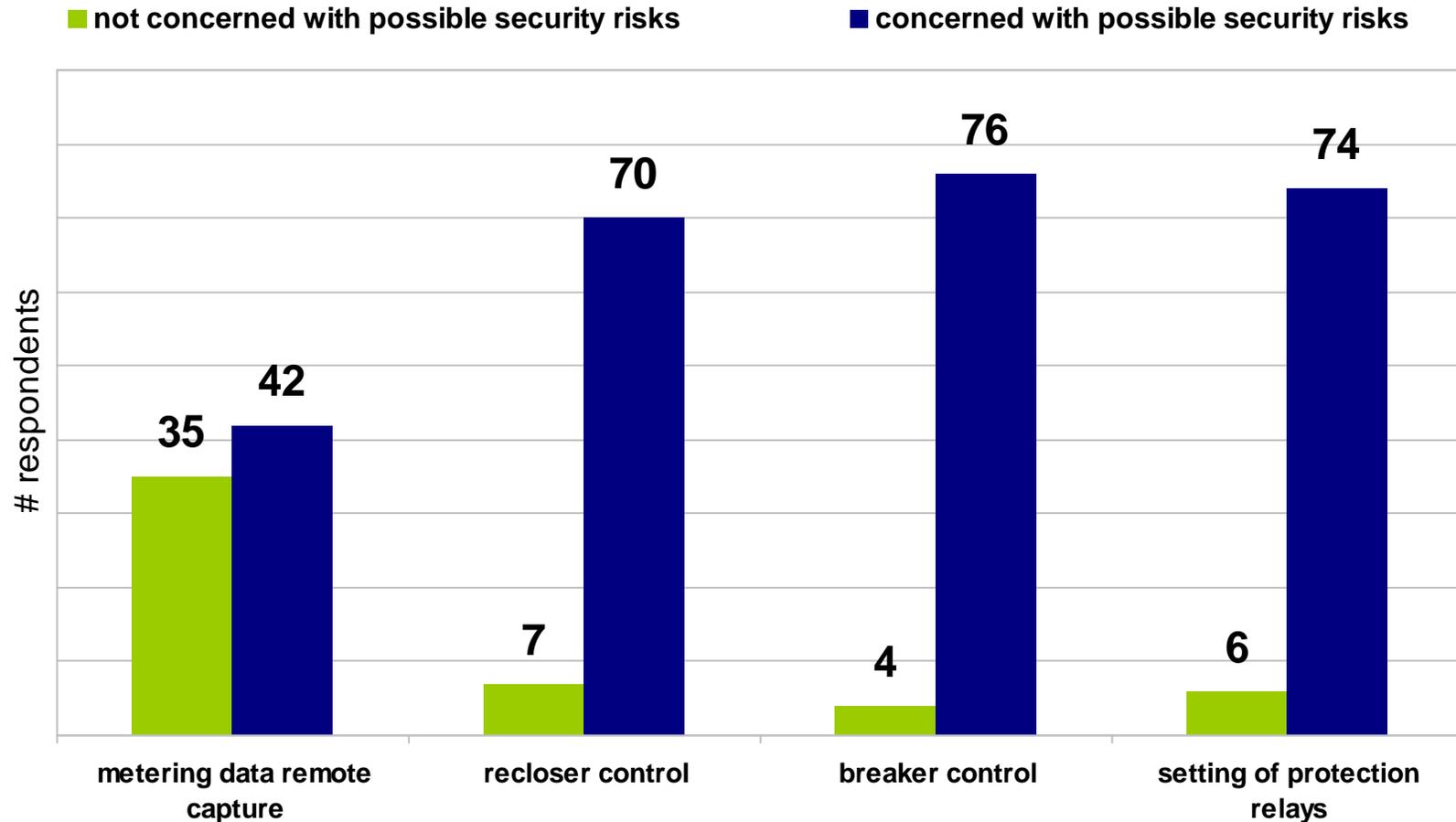


Figure 7a. Has a security risk assessment been performed at your utility that includes possible use of wireless communications for protection and automation?

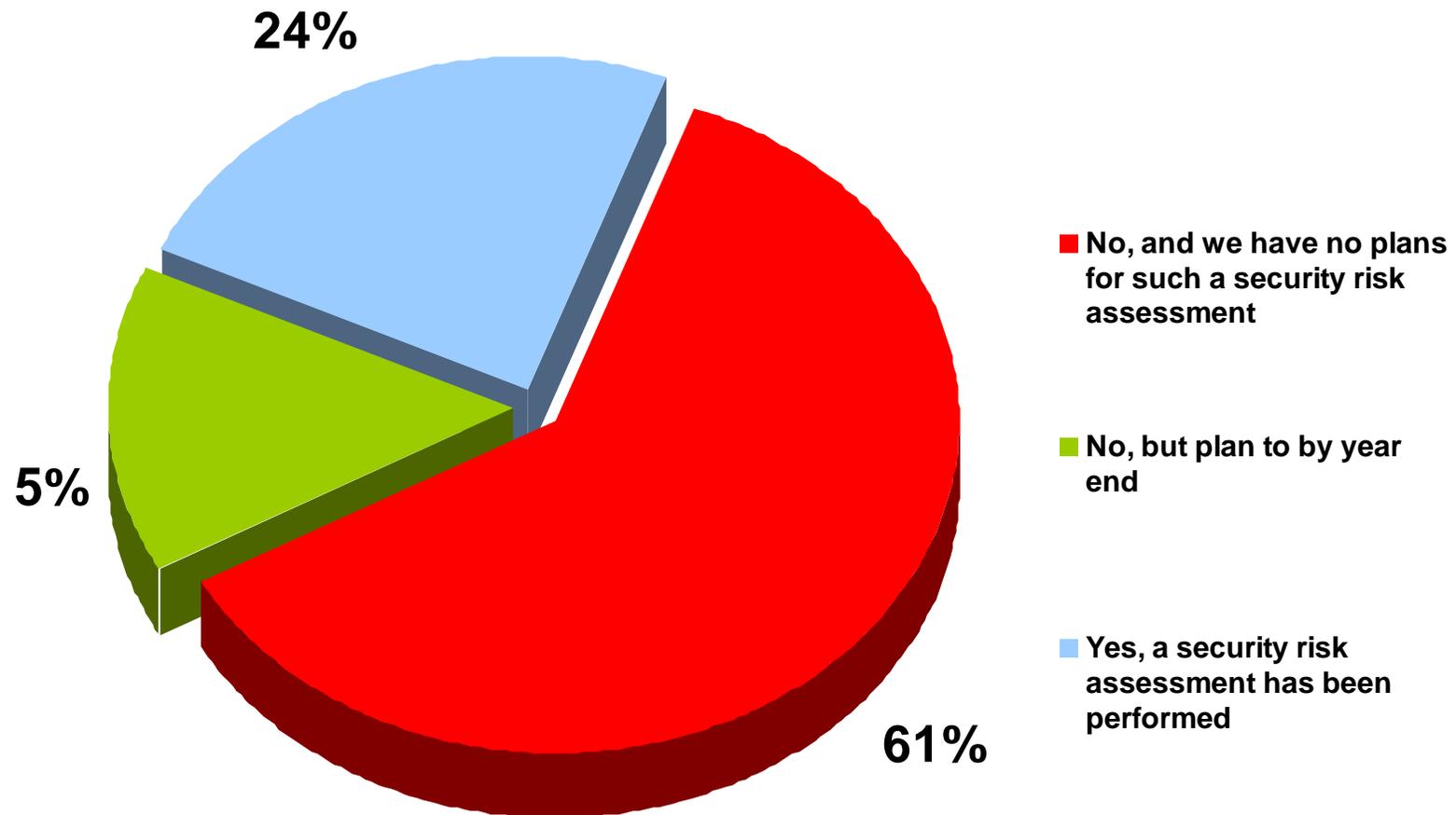


Figure 7b. Results of 19 security assessments

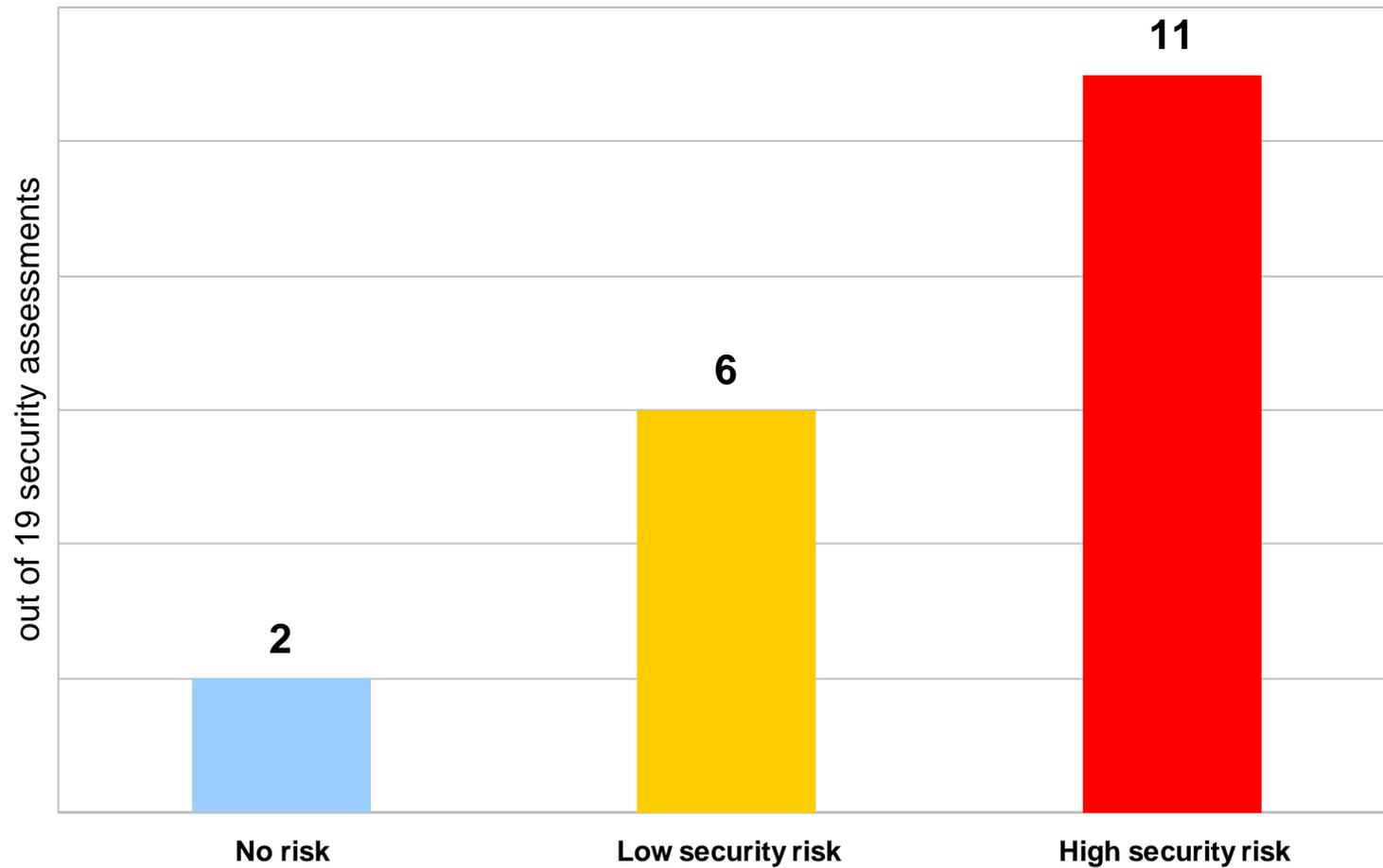


Figure 8a. **Wireless technology uses and plans for enterprise applications**

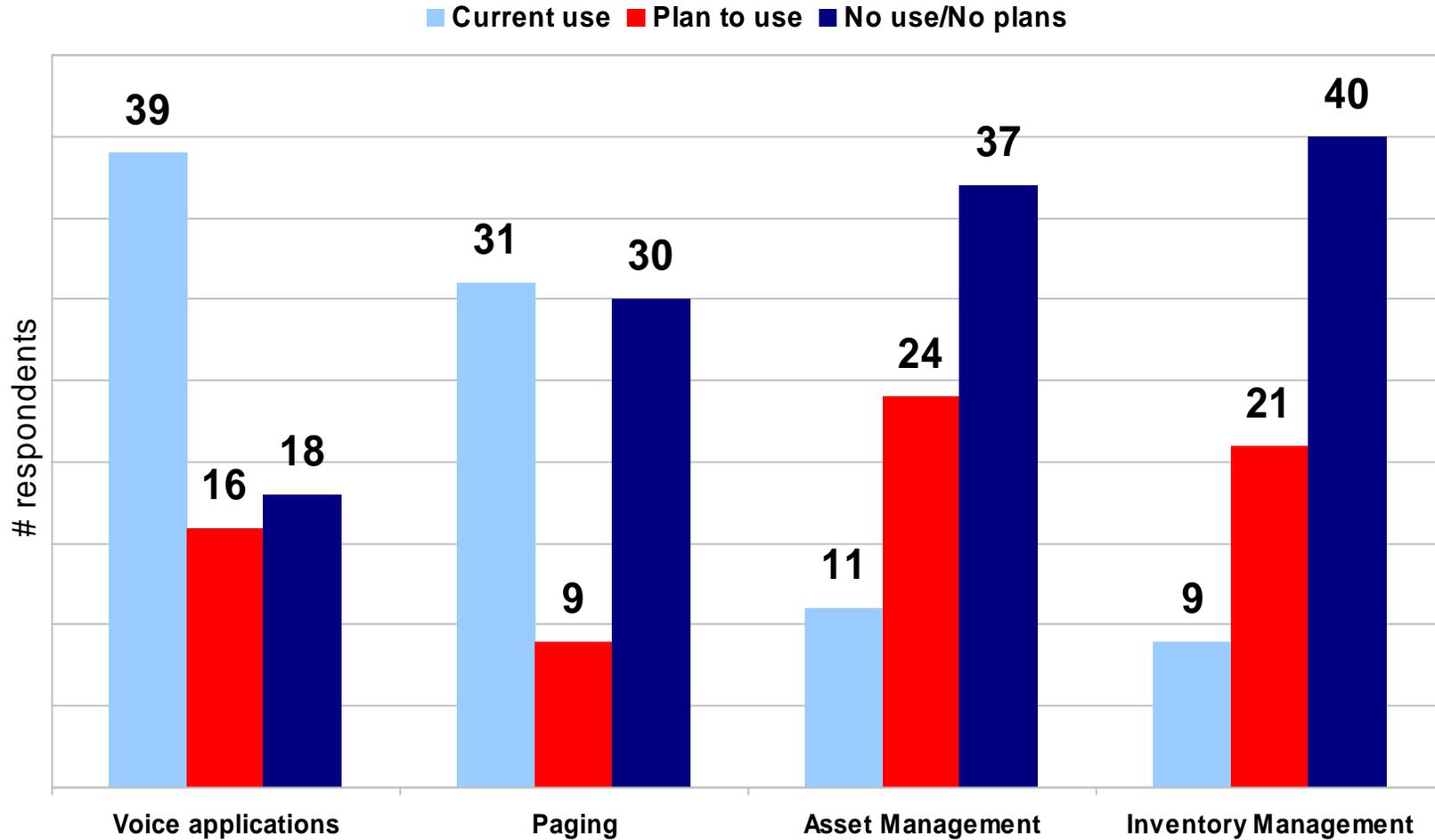
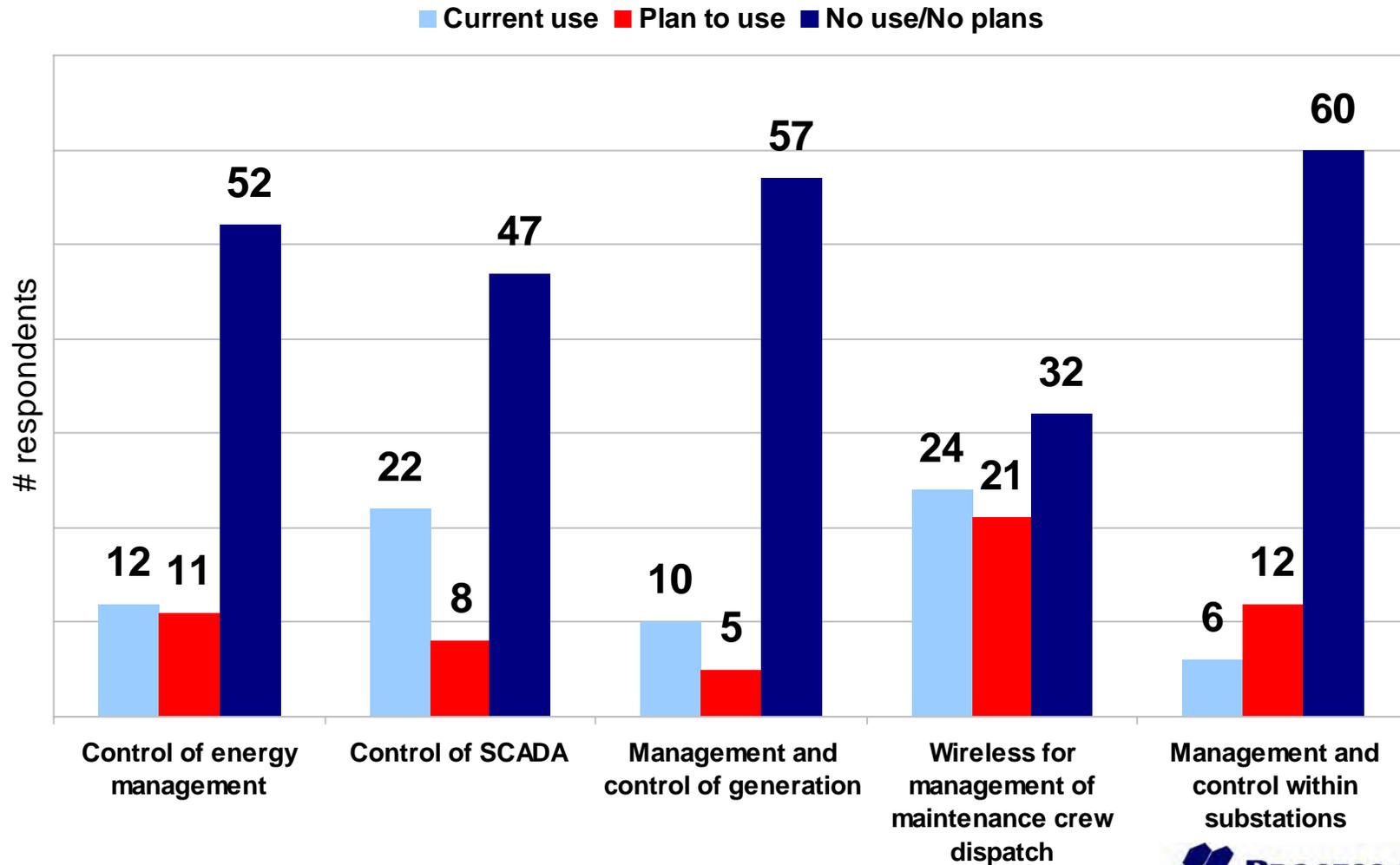


Figure 8b. **Wireless technology uses and plans for operational applications**



Countries Participating in the CIGRE Survey of Wireless Communications for Substation Protection and Automation

- **Argentina**
- **Australia**
- **Austria**
- **Belgium**
- **Canada**
- **China**
- **Cyprus**
- **Czech Republic**
- **Denmark**
- **Ecuador**
- **El Salvador**
- **Finland**
- **France**
- **Germany**
- **Greece**
- **Indonesia**
- **Ireland**
- **Israel**
- **Italy**
- **Lichtenstein**
- **Malaysia**
- **New Zealand**
- **Nigeria**
- **Philippines**
- **Portugal**
- **South Africa**
- **Spain**
- **Sweden**
- **Thailand**
- **U A E**
- **UK**
- **USA**



***Thanks for the Opportunity to Present
the CIGRE Study Findings!!***

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