



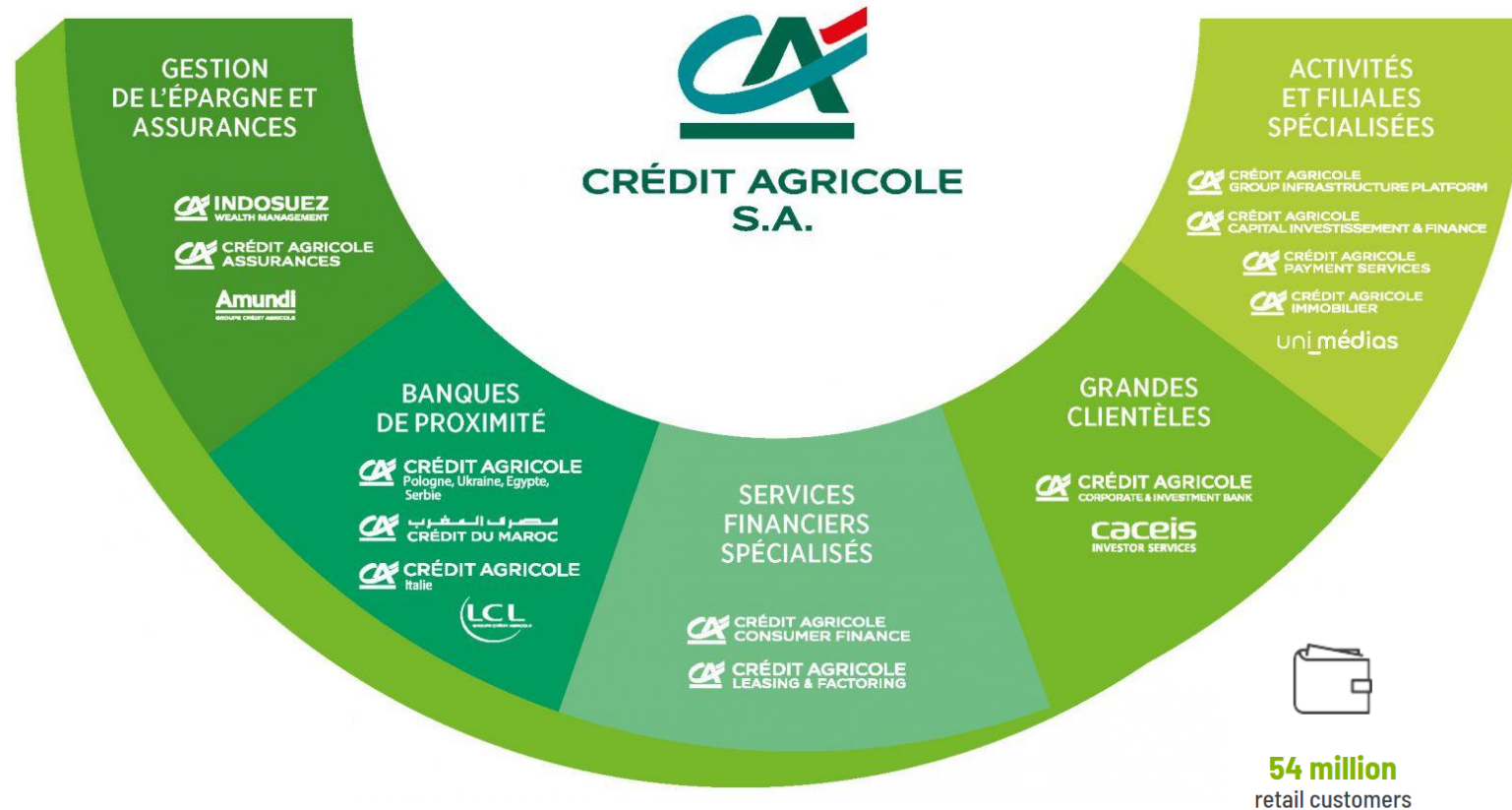
# What we need to embrace quantum computing

**An expression of user needs**

AGIR CHAQUE JOUR DANS VOTRE INTÉRÊT  
ET CELUI DE LA SOCIÉTÉ

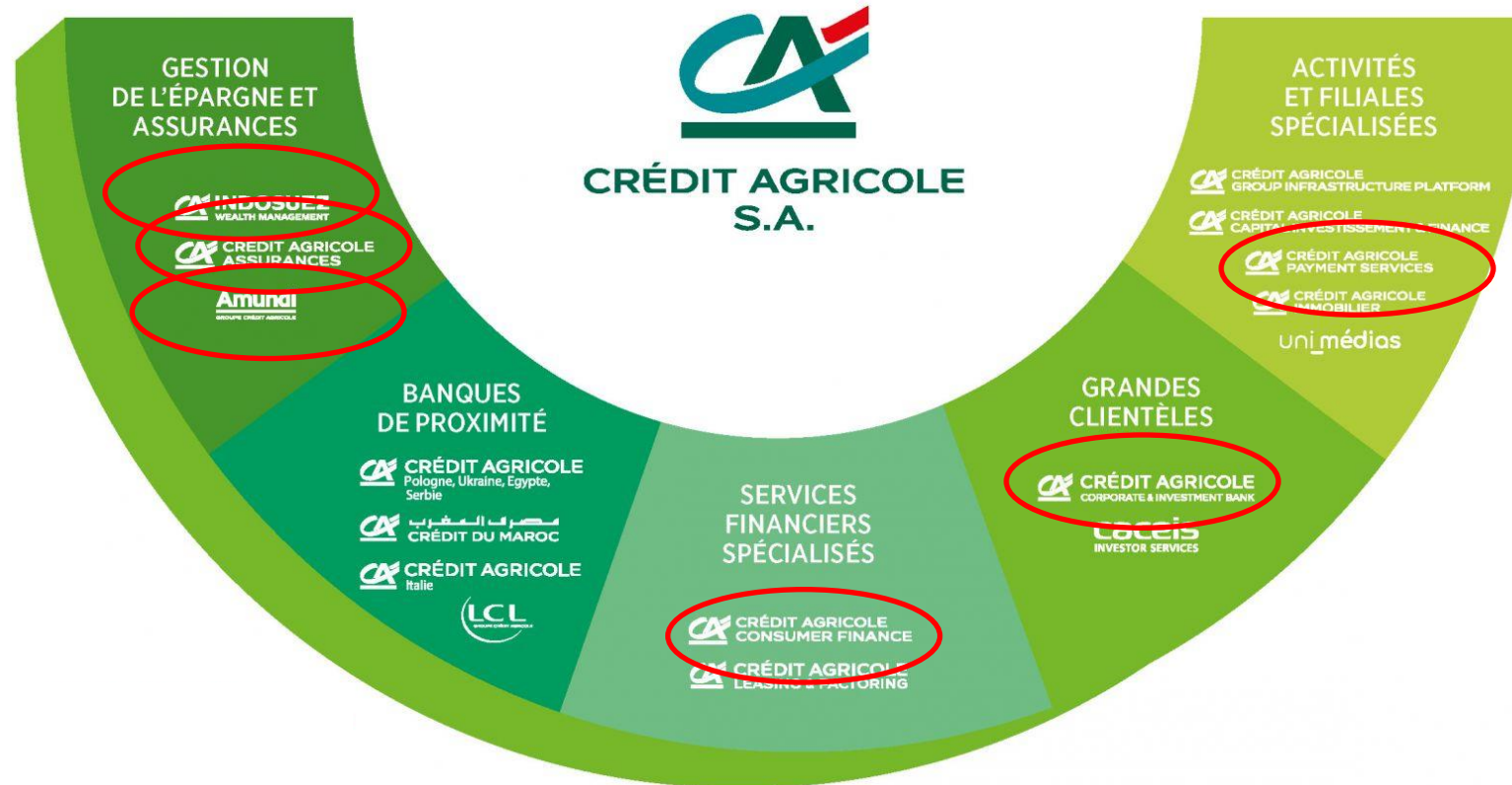


# Groupe Crédit Agricole – who we are



+ 39  
Regional  
banks

# Many complexe mathematical problems to solve



- Corporate banking
- Payments
- Wealth management
- Investment banking
- Insurance
- ...

# Reasons why we are interested in quantum



**Fast computing**



**Better results**



**Reduction of energy  
consumption**

# Our use cases



**Investment  
strategy and  
portfolio  
management**



**Fraud detection**



**Risk  
management and  
pricing**



**Analysis and  
optimization of  
various models**

# What we are doing so far



Technology and business monitoring



Competitor monitoring



Verification of value through experimentation (quantum inspired + quantum machines)



Meeting of stakeholders in the emerging ecosystem and development of relationships



Internal Skills Development: Acculturation and Training



# What do we need to work more with quantum?

**++ qubits**

**++ coherence time**

**++ gate fidelity**

**++ speed**

**-- errors ...**

# What we also need



- **Understand which use cases** can be treated at this early stage/ **which algorithms** can be processed?
- Which **technology** for which **type of algorithm**?
- **Application-oriented metrics** : quantify the utility of quantum machines in running specific algorithms to meet specific application needs



- Software needs to be more **user friendly**
- Approach **full stack** : different software per technology?
- What about **interoperability**?
- **Benchmark** comparisons between **quantum** solutions and **other** solutions (tensor networks, AI)



- Industrialisation/ cooperation?
  - High **costs** for **experimenting** without € ROI
- Will quantum processing be viable (high **production costs**)?
- Will the **benefit outweigh the costs**?



**Thank you very much for your attention.**