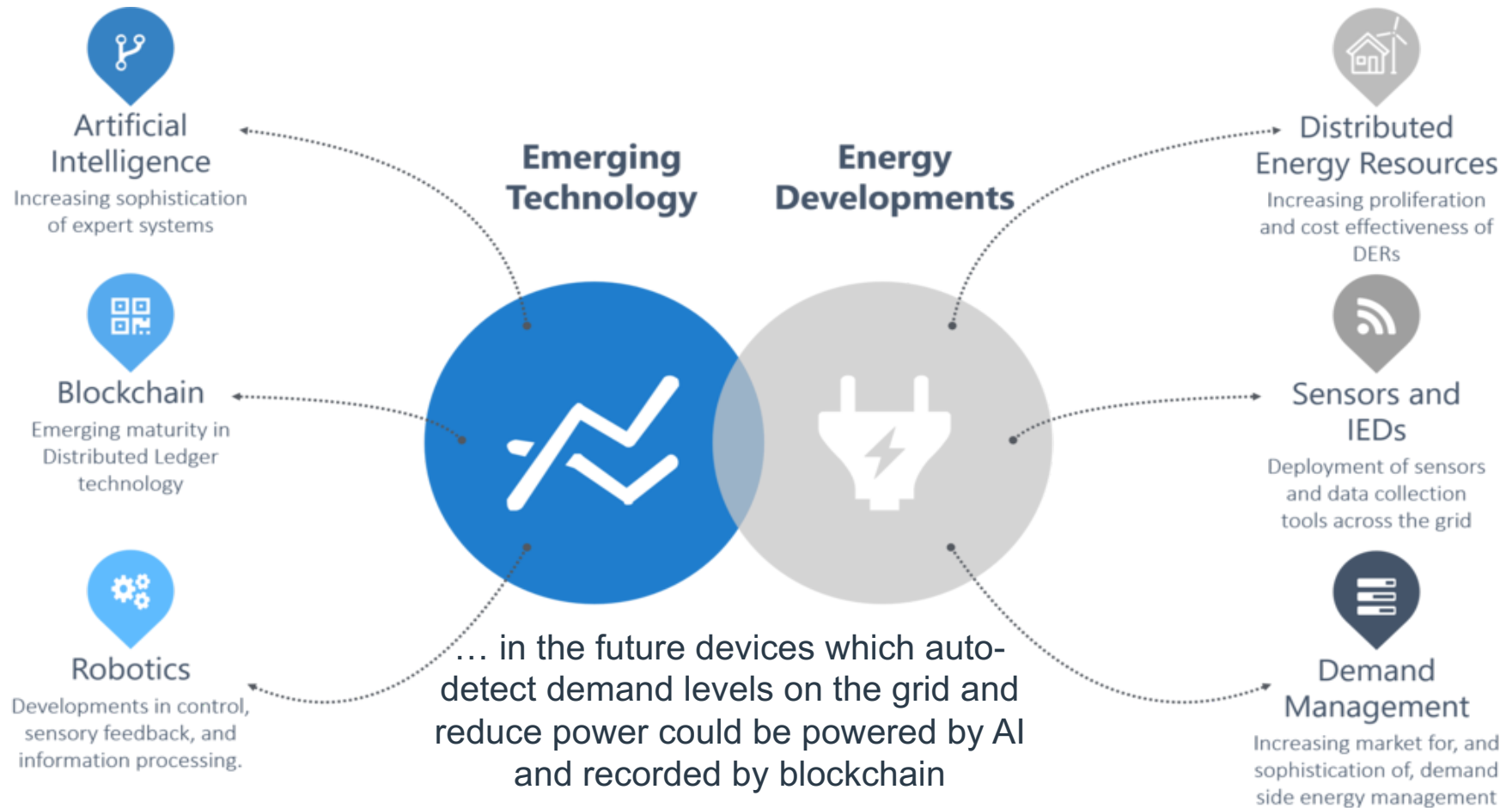


Blockchain, Emerging Technology & Energy

How technological change triggers new business models

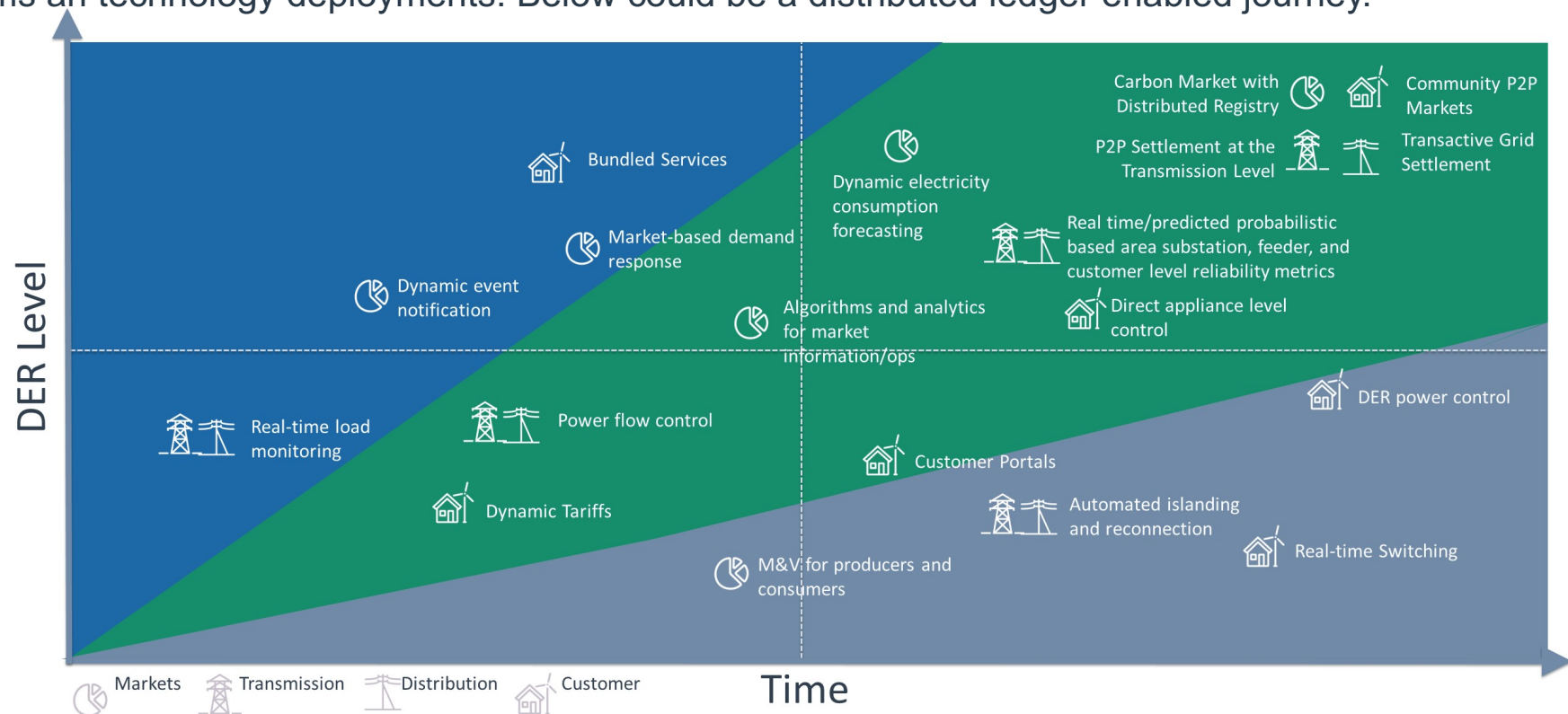
Presented at Swiss-US Energy Innovation Days - August 22nd 2017

The Fourth Industrial Revolution (4IR) and the Role of Energy Technology

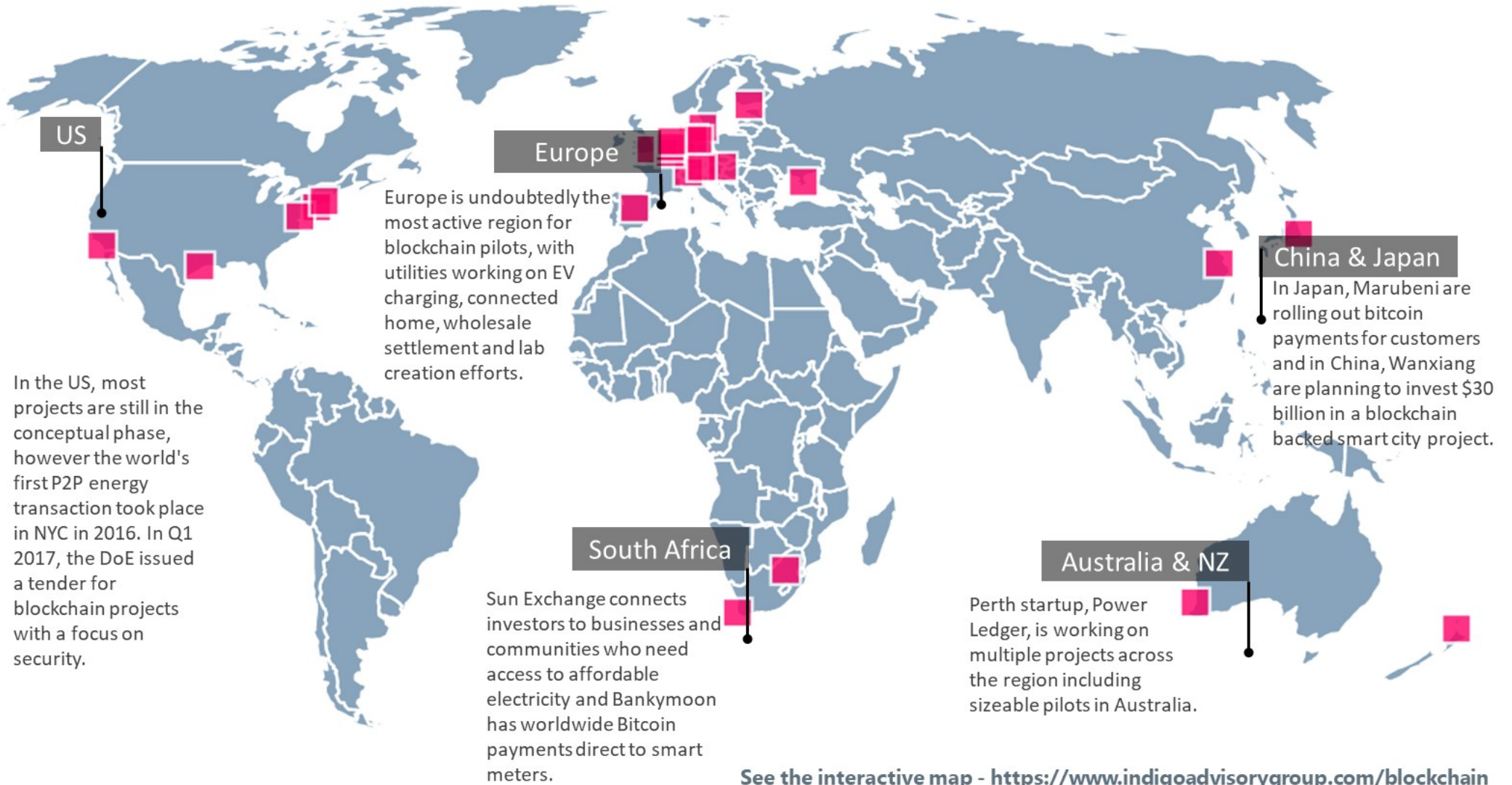


What Business Model these Emerging Technologies May Unlock

Many of the trends across the sector are converging on the idea of moving towards a transactive and dynamic energy system, where real time markets, peer to peer transactions and market animation will be enabled by new platforms and technology deployments. Below could be a distributed ledger enabled journey.



Globally we are Seeing a Host of Blockchain Activity in Energy and Utilities



This Activity is Giving Rise to New Applications and Vendors

P2P Trading & Connected Home



EV Charge / Share



Consortia and Research



Bitcoin Meter Payments



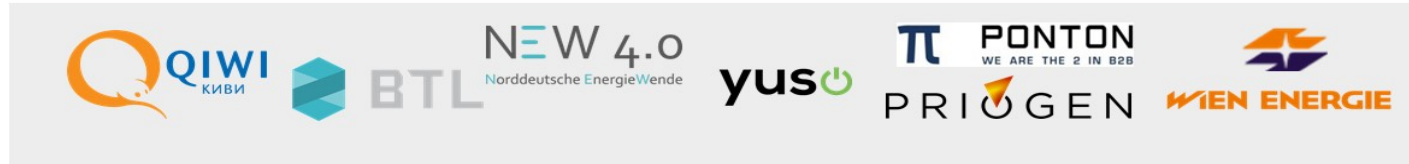
Solar Cryptocurrencies



Notable Startups



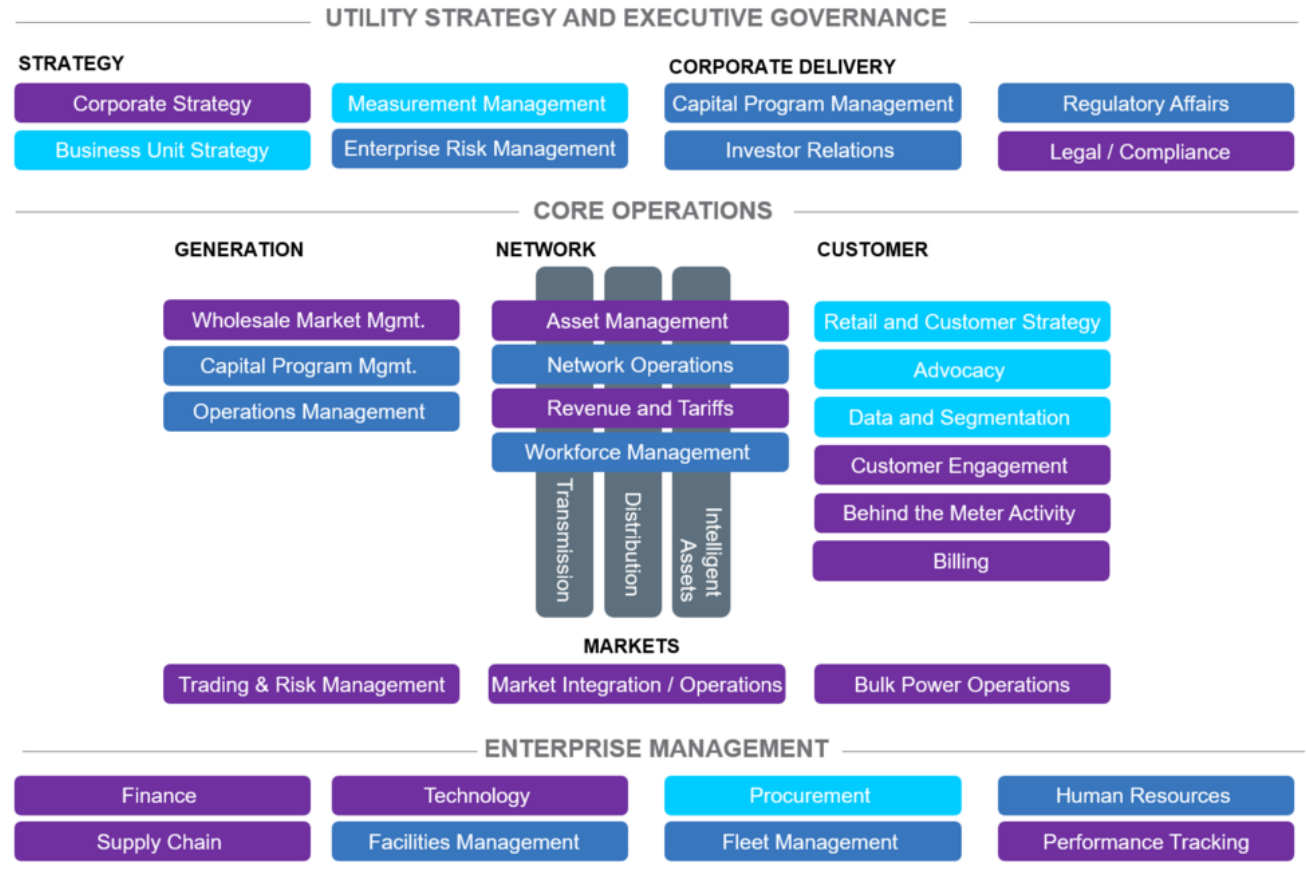
Wholesale Trading & Smart Markets



Blockchain and other Technologies are Impacting the Utility Business Model

In reality, there will be largely three types of impacts of these typed of new technology on the utility value chain.

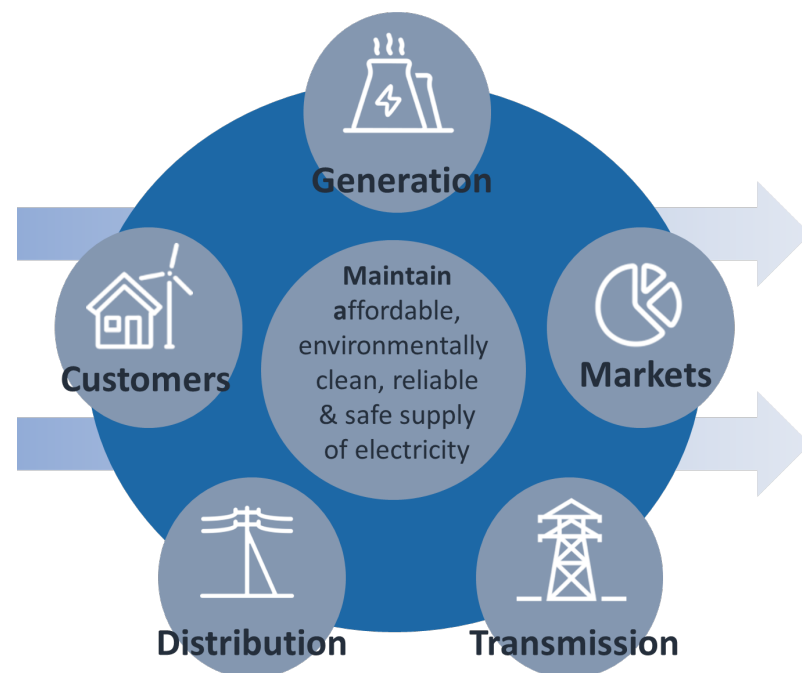
- Firstly, there will be those areas where there is *limited-to-no impact*
- For other areas the technology may *support* existing processes and make them even more robust and efficient
- Finally for some areas however, we may see some level of *disruption*.



While there are Benefits, Challenges exist for New Technologies like Blockchain

Benefits of blockchain technology...

- Faster transactions and lower transaction costs
- Disintermediation & trustless exchange
- Empowered users
- High quality data
- Reliability, longevity and durability
- Process integrity
- Immutability and transparency
- Market and eco-system simplification



...challenges of blockchain technology

- Standards needed
- Nascent technology
- Uncertain regulatory status
- Large energy consumption
- Cost
- Control, security, and privacy
- Integration concerns
- Cultural adoption
- Rebranding an older technology
- "magical middleware" in the cloud that has advanced databaselike capabilities

Indigo

ADVISORY



insights@indigoadvisorygroup.com



+212 203 6144



www.indigoadvisorygroup.com



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