

# Monetary Assessment of Battery Life on Smartphones

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# Smartphone Battery

- Is always running out!



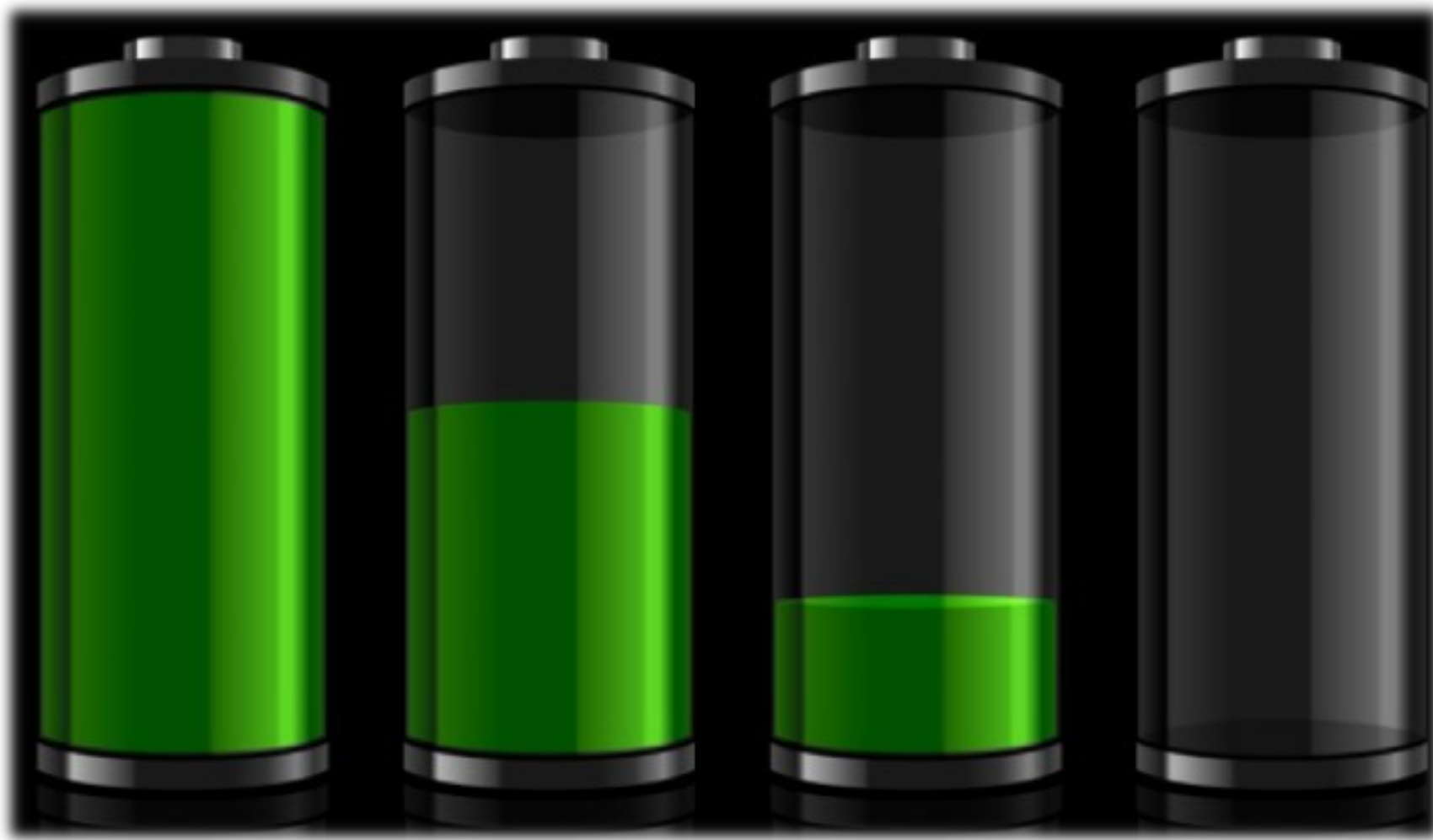
# Weekly Articles & Research

- Manage and model battery life



# Perceived Battery Life

- Valuable! How valuable?





# Related Work

- Sensor data and location are valuable.
- Smartphone battery life more valuable?



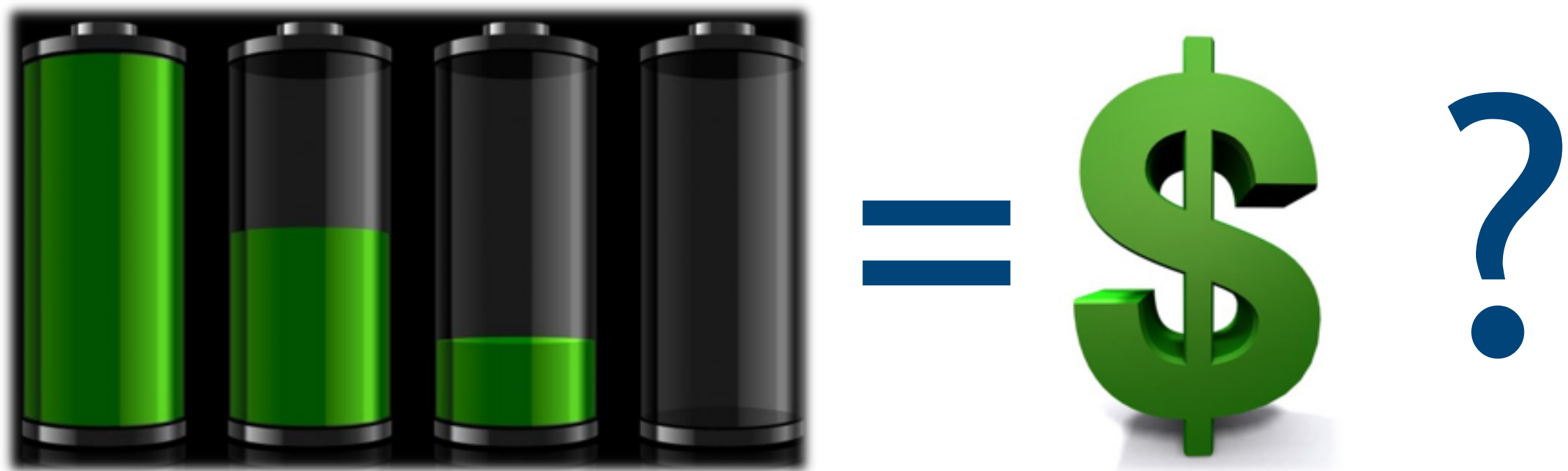






# Our Study

- Quantifying the perceived monetary value of smartphone battery life



# Study Description

- 22 participants auctioned their battery (10% units)
- Winners got money
- Winners lost 10% battery life in real-time
- Bid hourly for 8 days
- From 10:00 to 22:00 = 13 auctions per day
- Phones charged during the time were excluded from the auction
- Concluding workshop (interviews)

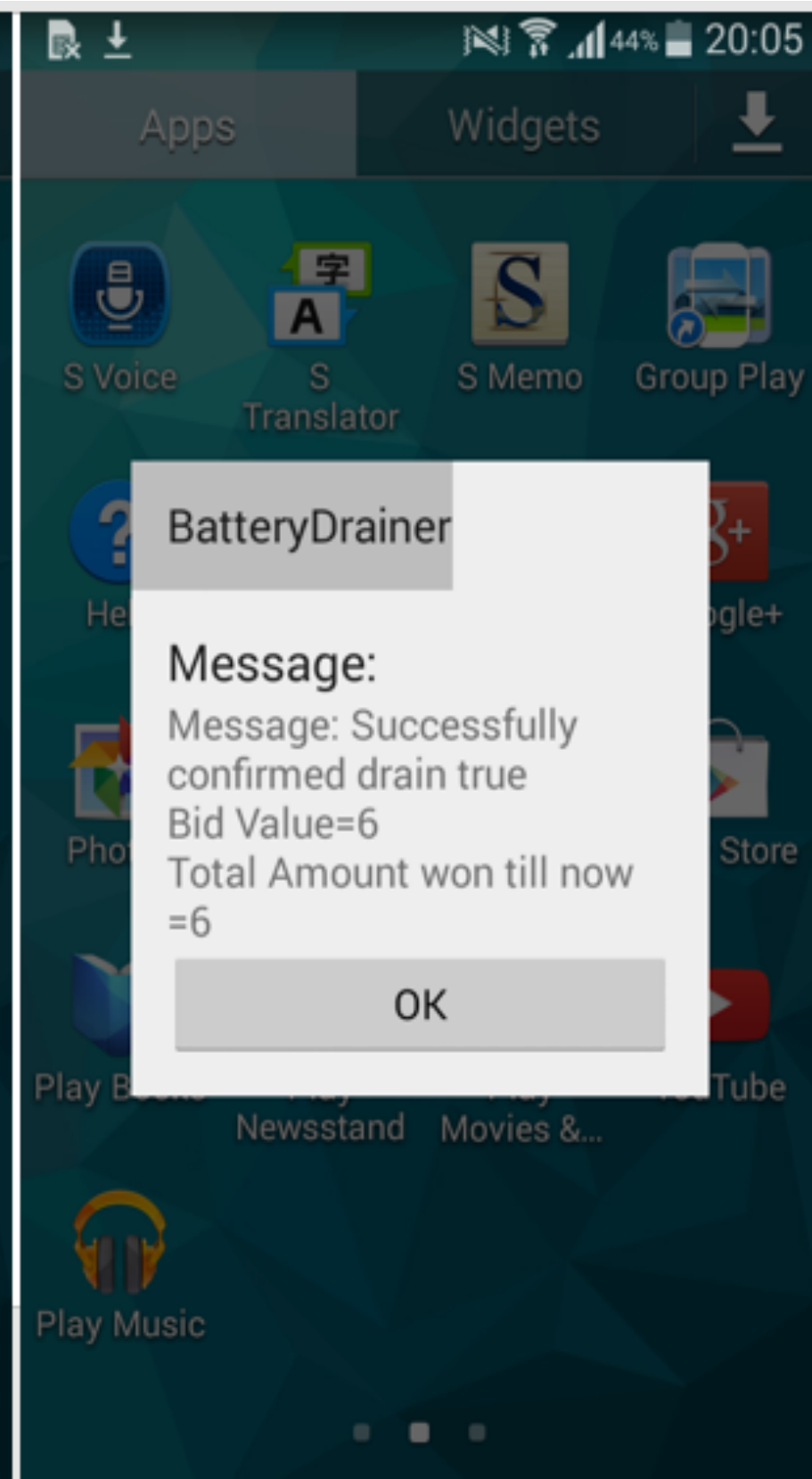
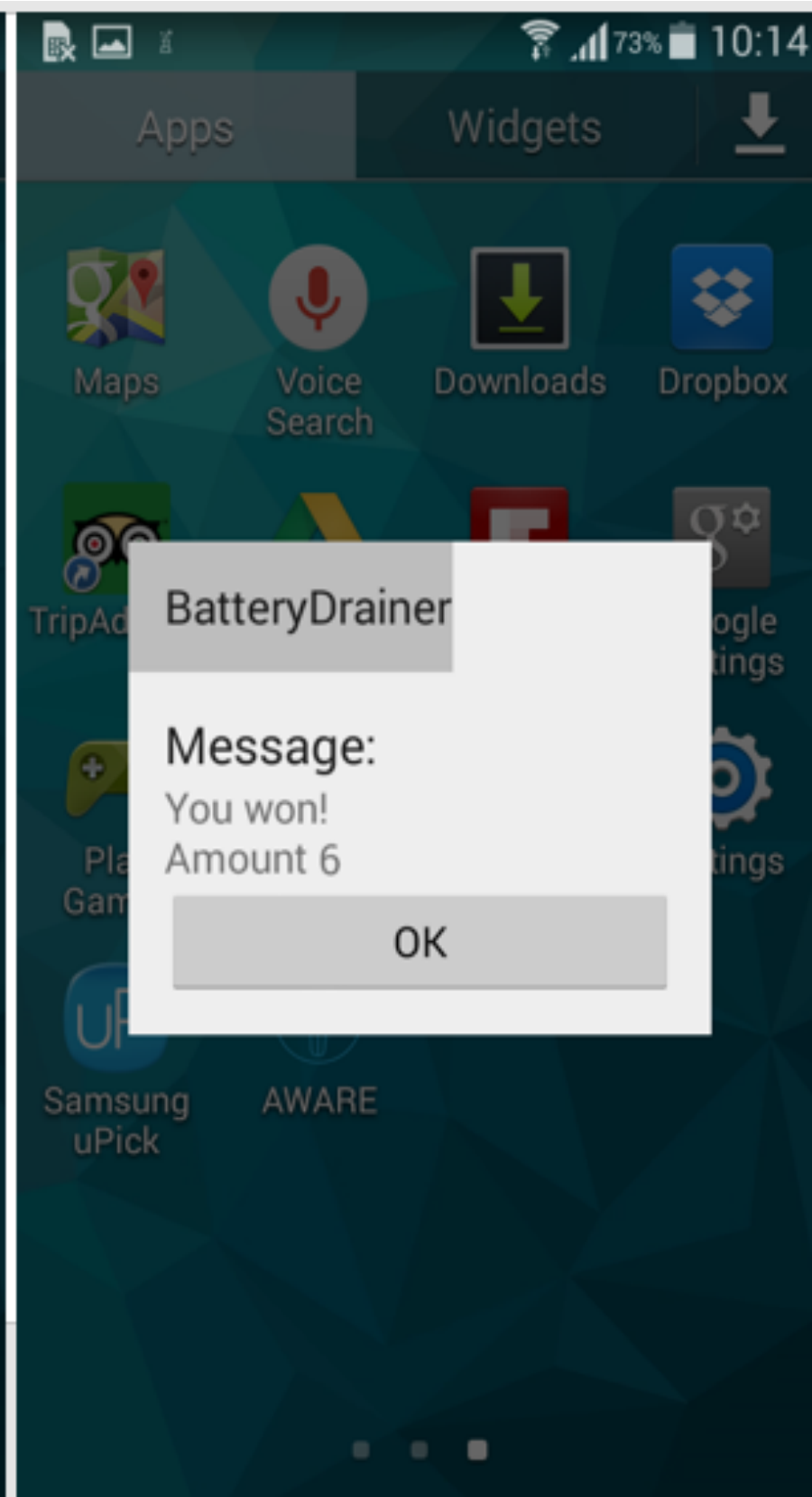
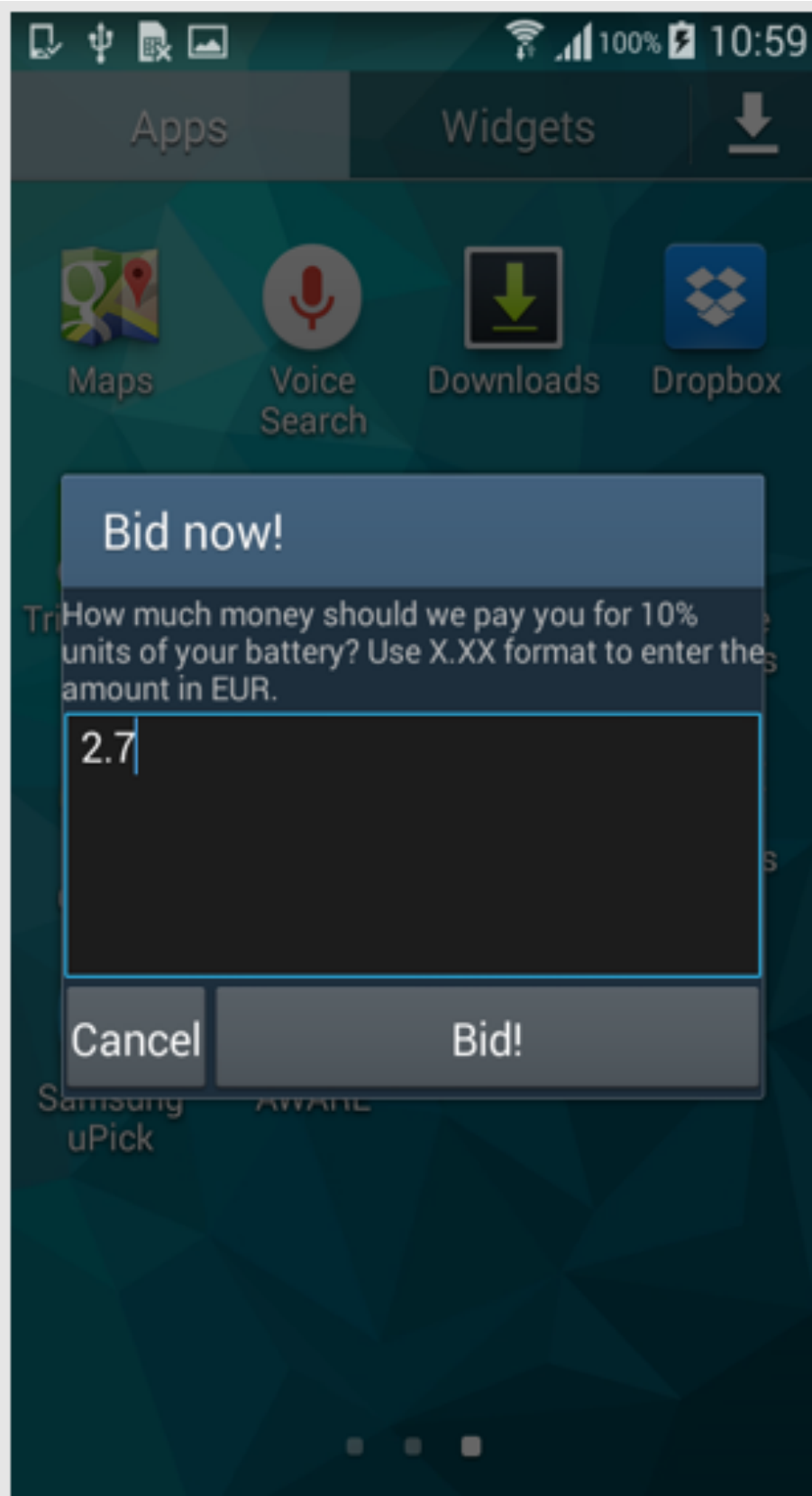




# Battery Auction / Drainer App

- Logs battery level, application use, bids
- Based on AWARE (<http://www.awareframework.com>)





# Auction

- Reverse second-price closed-bid auction
- Truth-telling, widely used
- Optimal bidding strategy is to be honest



0.50



1.50



1.50



2.00



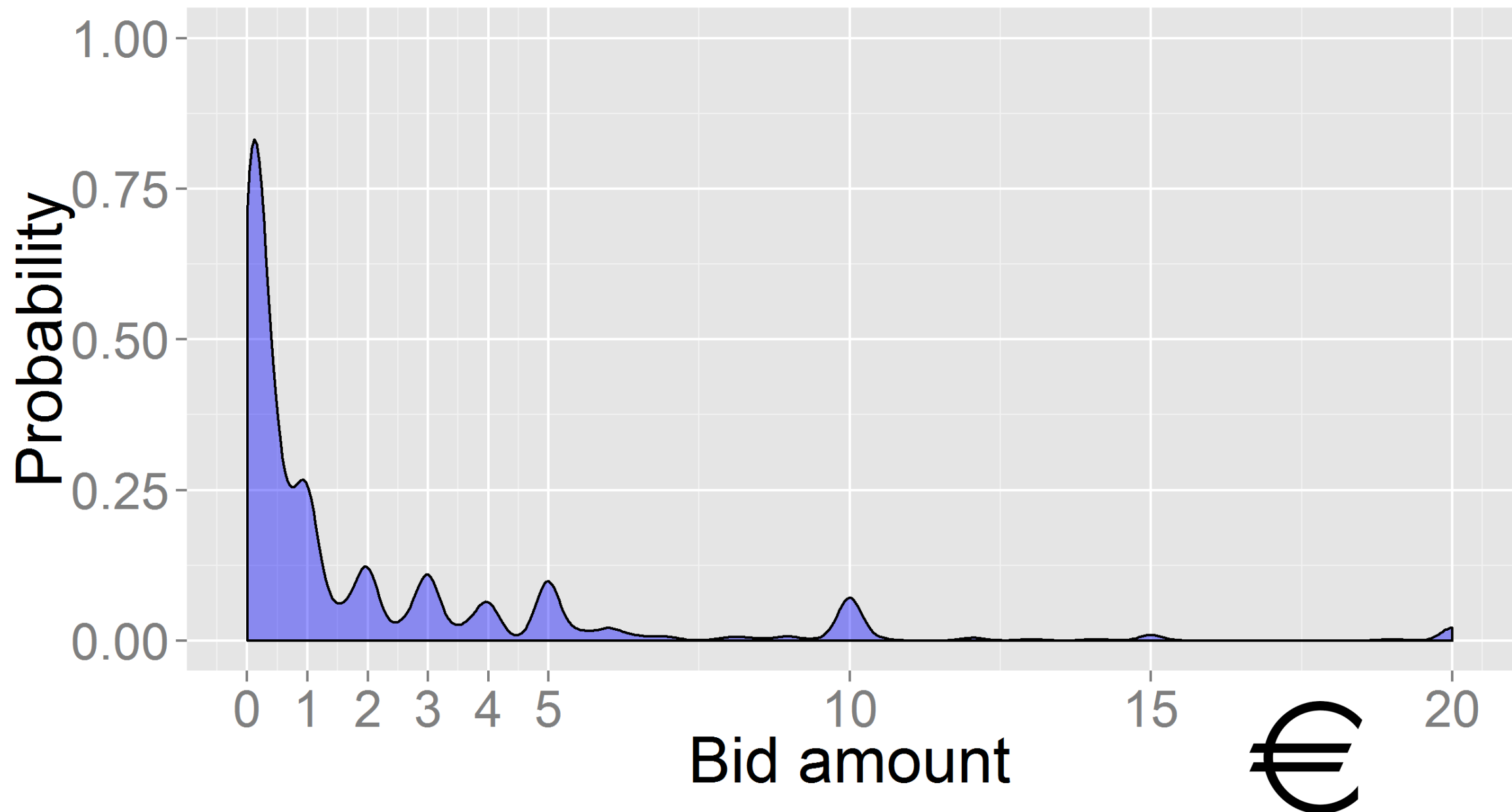


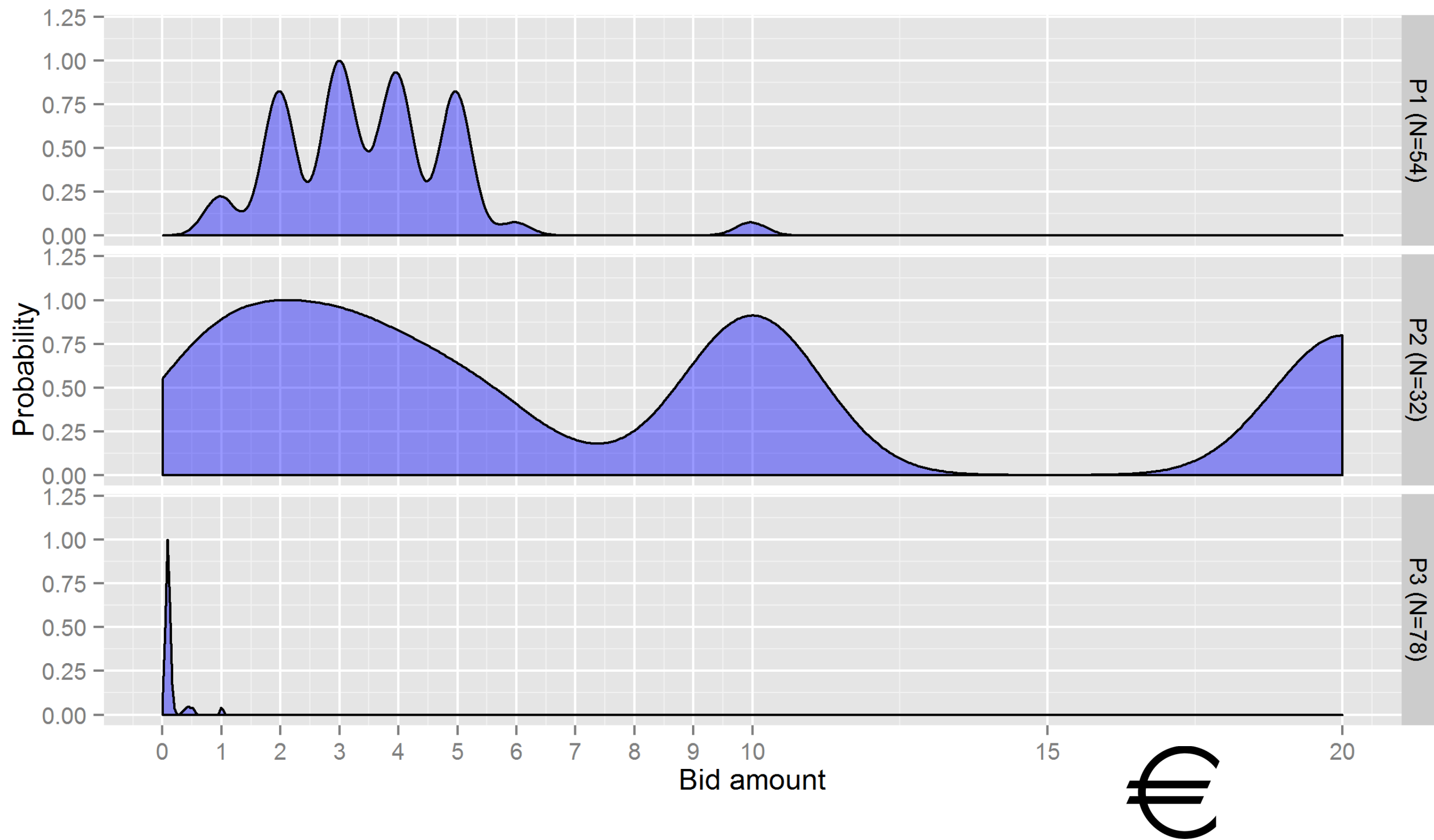
# Results

- 1211 bids, (out of ~2K possible bids), 120 cancels, 342 expired, 467 missing bids (powered off, charging)
- 480 charging events
- 221 808 application events



# Bidding Behavior: Overview

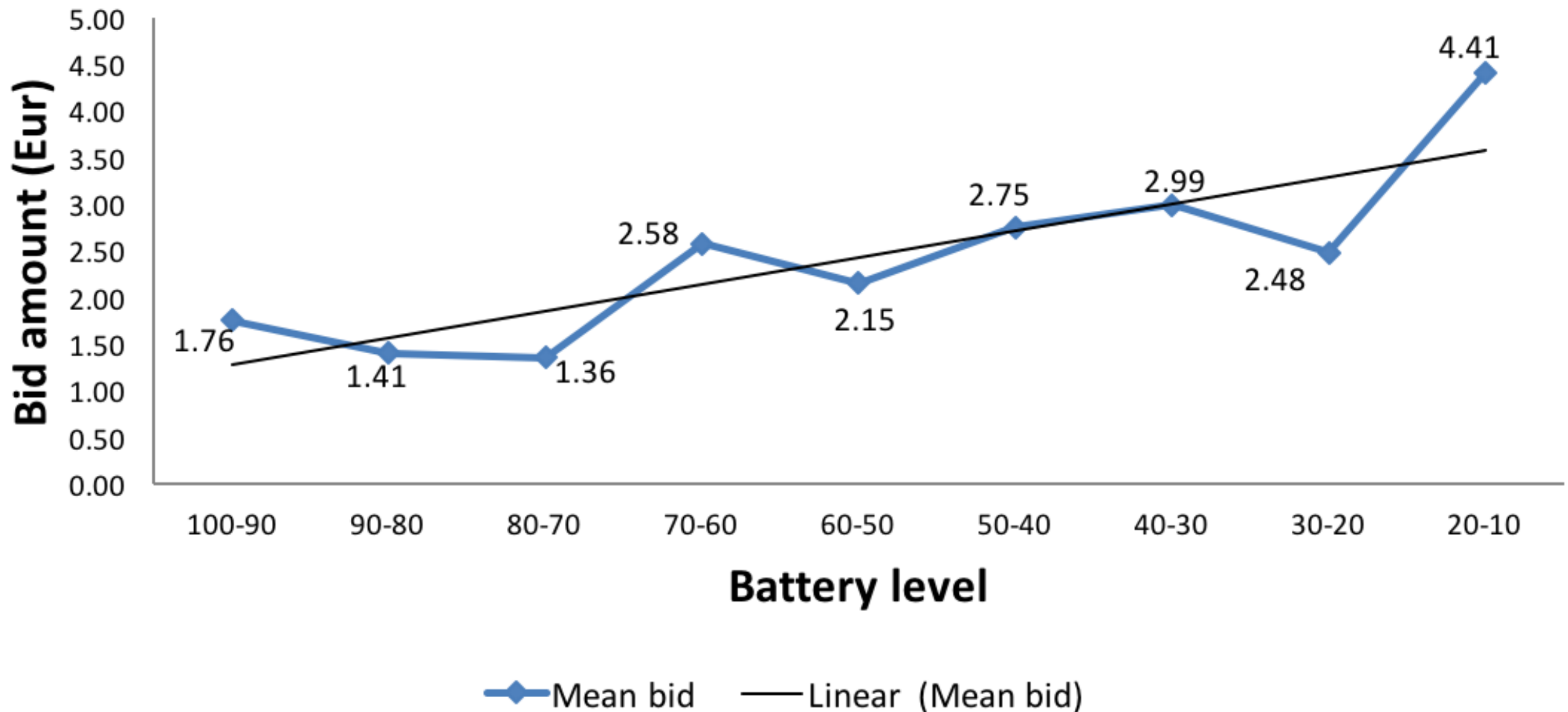






# Per Battery Condition

Bids per battery level



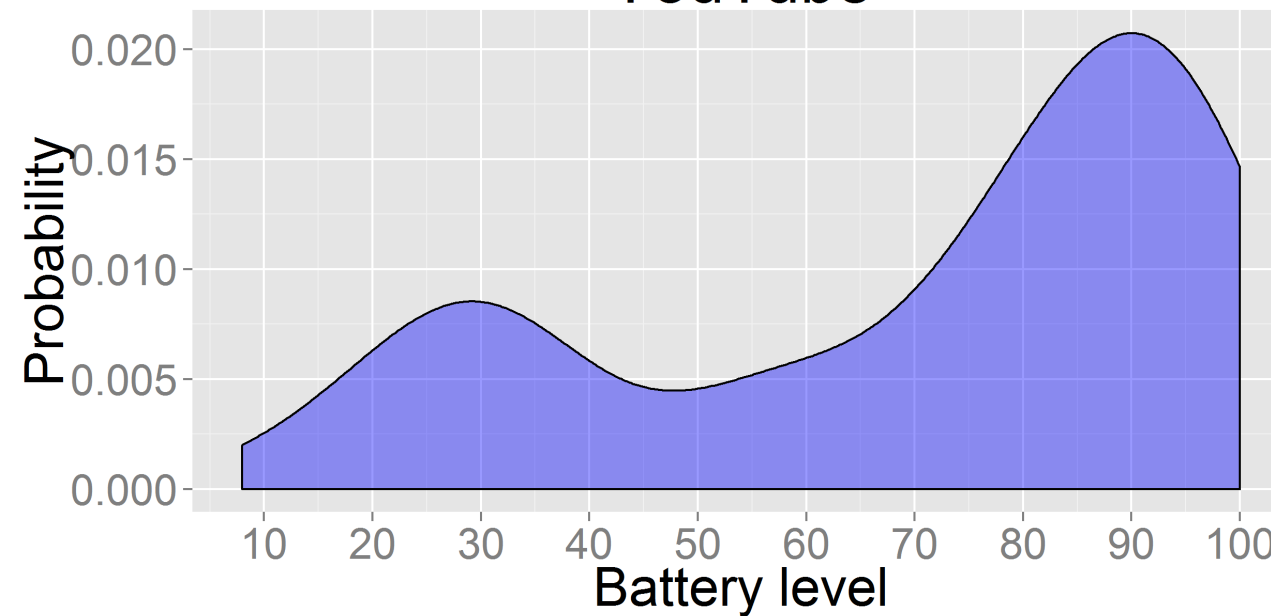
# Value of 100~10% battery life

21.89€

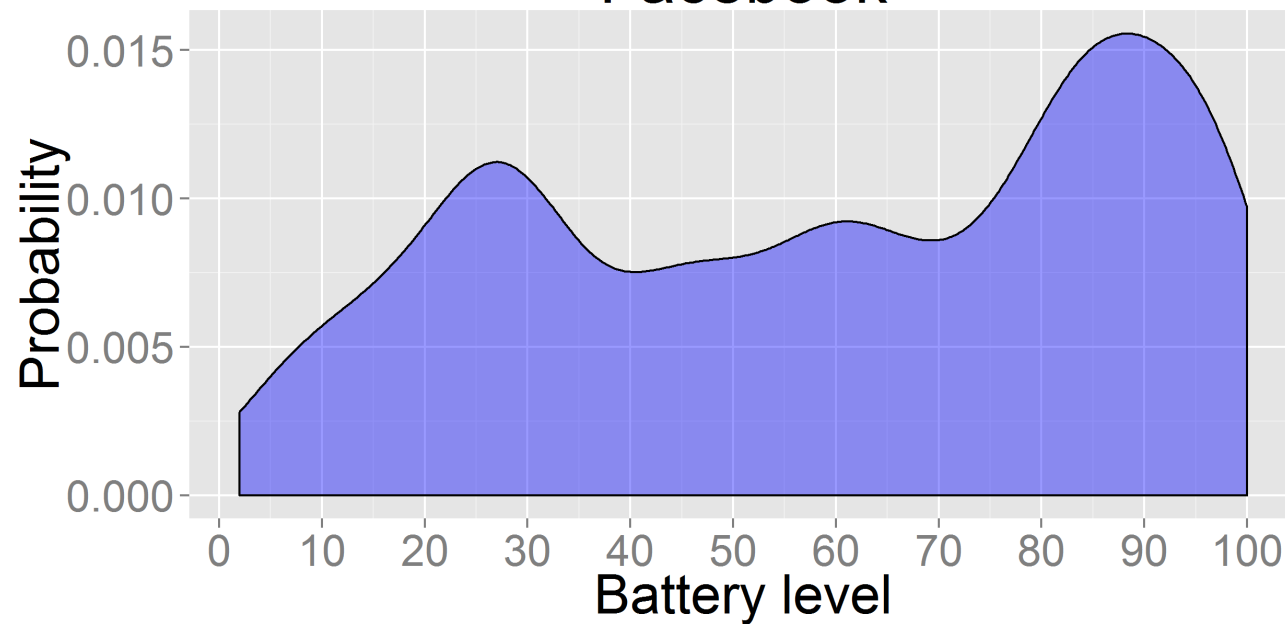


# App Use

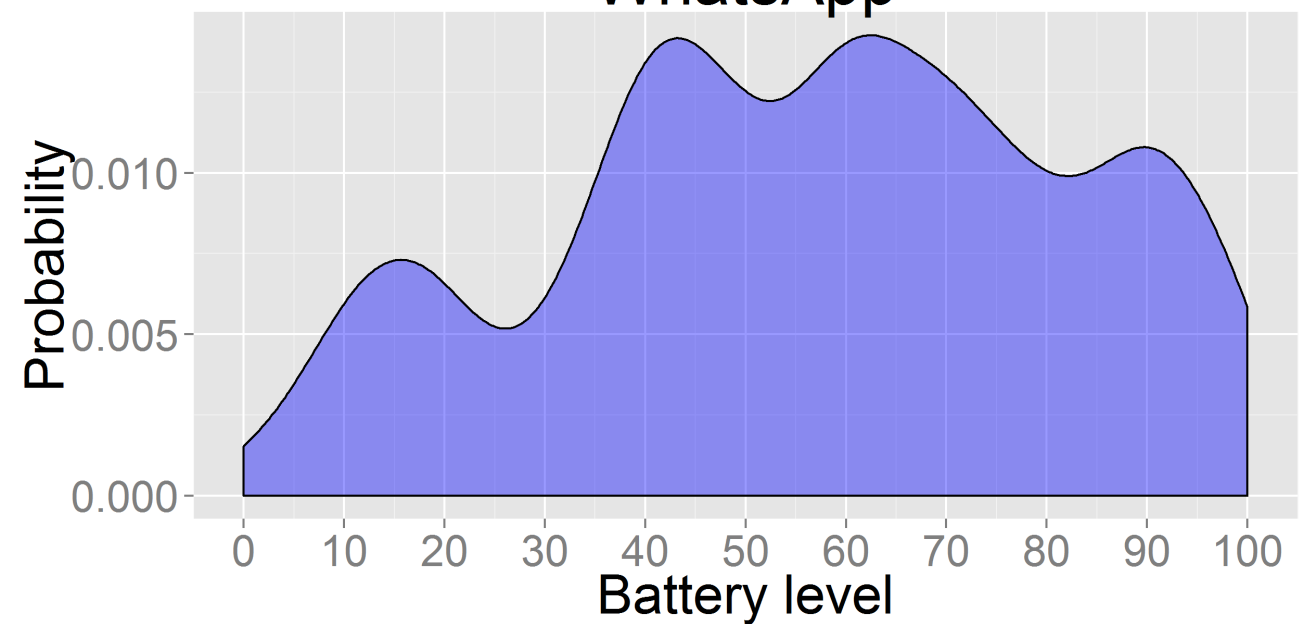
YouTube



Facebook



WhatsApp





# Qualitative Results

- Battery value: highly context-dependent



# Qualitative Results

- Location

“When I am next to a charger, I don’t really care.”

“In festivals or traveling, then it’s a massive problem.”



# Qualitative Results

- Selling battery to friends or strangers?

“I would rather say no for a friend than ask for money!”

“Not money from friends... give me battery, I give you lunch... So something tangible instead of money.”





# Sharing: Benefit VS Cost?



# Make Better Use of Battery

- Use battery when suitable.



# Take-away Points

- 1. Perceived battery life value is complex!
  - Many factors
  - Valuable last 20% battery
- 2. We provide insights of this value.
  - Application value
  - Compensation



# Thank you! Questions?



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