Tech for a Better Future
First Overview by L’Atelier BNP Paribas Asia

With main focus on Digital Financial Inclusion and Technologies for the Green Economy
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- Case Study on Digital Financial Inclusion Initiatives in Asia

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01
Tech for a Better Future
A better future from where we stand; and how we believe technology can help
Towards a better future: “Building a prosperous, fairer world while safeguarding the planet’s resources”

L’Atelier believes that helping to achieve the UN’s 17 Sustainable Development Goals (SDGs) is a pathway towards building a better future

UN Sustainable Development Goals (2015)

1. No Poverty
2. Zero Hunger
3. Good Health and Well-Being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Consumption and Production
13. Climate Action
14. Life below Water
15. Life on Land
16. Peace, Justice, and Strong Institutions
17. Partnerships for the Goals

The five SDG broad themes

Empowering People
Countries have resolved to end poverty and hunger and ensure that everyone is able to fulfill his/her potential in dignity and equality and in a healthy environment

Safeguarding the Planet
Protect the planet from degradation and take urgent action on climate change

Creating Shared Prosperity
Ensure that everyone can enjoy a prosperous and fulfilling life and that progress takes place in harmony with nature

Peace
Foster peaceful, just, and inclusive societies free from fear and violence

Strengthening Partnerships
Mobilise the means to implement Agenda 2030, focusing on the poorest and most vulnerable, through strong global partnerships

Sources: UN official website, World Bank official website
Digital Financial Inclusion and GreenTech are important enablers for attaining the Sustainable Development Goals

L’Atelier recognises that technologies, especially those supporting Financial Inclusion and the Green Economy, are cross-cutting enablers for achieving the SDG targets

Providing access to basic financial services for more people at the base of the pyramid

Impact relating to Financial Inclusion

Technologies for Financial Inclusion

- Digital KYC
- Mobile phone as a service channel
- Lending to under-served populations using alternative data for credit scoring
- Cost savings on the expansion of banking service infrastructure via Open APIs, Cloud, blockchain, etc.
- Other

Impact in relation to SDGs

SDG 1,2,3, 5, 8,9,10,16, 17…

Impact relating to the Green Economy

Technologies for the Green Economy

- Renewable Energy
- Efficient energy consumption and distribution planning using IoT, Cloud, Big Data, AI, etc.
- Digital platforms for sharing of vehicles (bikes, electric cars, etc)
- Other

Impact in relation to SDGs

SDG 7,11, 12, 13, 15…

Sources: UNSGSA, Achieving the Sustainable Development Goals - The Role of Financial Inclusion, UN Sustainable Development Platform, L’Atelier Analysis
Technology for Financial Inclusion and the Green Economy has been increasingly contributing to attaining the SDGs

Selected examples of the results of applying new tech for Digital Financial Inclusion and the Green Economy

In India, digitising government transfers cut bribes paid in order to receive the transfer payment by 47% and increased beneficiaries’ receipts by excluding middlemen who skimmed funds (Muralidharan et al, 2014)

Mobile money has lifted as many as 194K households – 2% of the Kenyan population – out of poverty and has been effective in improving the economic lives of poor women and members of female-headed households (2016, Study by Georgetown University)

China’s Mobike, a mobile bike-sharing platform, helped to save 41.5 million litres of gasoline, thus avoiding 130,956 tons of CO2 emissions in China in the 1st quarter of 2017 alone (Mobike, 2017)

Sources: UNCDF official website, George Town University official website, Mobike official website, L’Atelier Analysis
Tech for a Better Future – First Overview by L’Atelier Asia

To mark the 10-year anniversary of L’Atelier BNP Paribas Asia, our team drew up a case study on ‘Technology for a Better Future’, focusing on two main fields, with Asia as geographical perimeter.

Topic #1
Financial Inclusion and the Impact of Digital Technology in Asia

72% of the world’s unbanked population is concentrated in 25 nations with a predominant part coming from Asia.

Topic #2
Green Economy and the Impact of Emerging Technologies in Asia

* Contents for the case studies on the following pages
02
Tech for a Better Future: Financial Inclusion
2.1. Overview of Financial Inclusion and the Impact of Digital Technology in Asia
Financial Inclusion

“Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way.”*  

Financial Inclusion especially concerns certain groups that are more excluded from basic services

Financially excluded groups identified by the World Bank

**Women**  
• In developing countries, 59% of men reported having a bank account in 2014, while only 50% of women did.

**Rural poor**  
• 440 million unbanked adults in developing countries receive cash payments for the sale of agricultural products

**Remote or hard-to-reach populations**  
• 80% of all adults in Fragile and Conflict-Affected States are outside the formal financial system

**Micro- and small firms**  
• 200+ million formal and informal micro-, small and medium-sized enterprises (MSMEs) in emerging economies lack adequate financing

*Definition provided by World Bank / Source: World Bank Official website (2014 Data)
73% of the world’s unbanked population is concentrated in 25 nations, with a predominant proportion in Asia

**Figure 1: % of the world’s unbanked adult population* in each focus country (2014)**

<table>
<thead>
<tr>
<th>Country</th>
<th>Population</th>
<th>Acct (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>1.357 billion</td>
<td>79%</td>
</tr>
<tr>
<td>China</td>
<td>1.252 billion</td>
<td>53%</td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td>5.60%</td>
</tr>
<tr>
<td>Pakistan</td>
<td></td>
<td>5.20%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td></td>
<td>3.70%</td>
</tr>
<tr>
<td>Nigeria</td>
<td></td>
<td>2.70%</td>
</tr>
<tr>
<td>Mexico</td>
<td></td>
<td>2.60%</td>
</tr>
<tr>
<td>Egypt</td>
<td></td>
<td>2.40%</td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td>2.40%</td>
</tr>
<tr>
<td>Vietnam</td>
<td></td>
<td>2.40%</td>
</tr>
<tr>
<td>Philippines</td>
<td></td>
<td>2.20%</td>
</tr>
<tr>
<td>Ethiopia</td>
<td></td>
<td>2.10%</td>
</tr>
</tbody>
</table>


* Working-age adults worldwide who do not hold a basic banking account and do not have access to formal financial services
Financial Inclusion has become a worldwide priority, and is an urgent issue for developing nations in Asia

Global organisations regard financial inclusion as a key enabler for mitigating poverty and achieving sustainable growth

- Financial inclusion has been identified as an enabler for 7 of the 17 Sustainable Development Goals.
- The G20 has committed to implementing the G20 High-Level Principles for Digital Financial Inclusion.
- The World Bank Group regards financial inclusion as a key enabler for reducing extreme poverty and boosting shared prosperity and has put forward the ambitious goal of reaching Universal Financial Access (UFA) by 2020.

Developing nations, including India and China, have achieved strong growth in account ownership

Figure 2: % of adults in developing countries holding bank accounts (2011-2014)*

<table>
<thead>
<tr>
<th>Region</th>
<th>2011</th>
<th>2014</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>51%</td>
<td>62%</td>
<td>22%</td>
</tr>
<tr>
<td>China</td>
<td>64%</td>
<td>79%</td>
<td>23%</td>
</tr>
<tr>
<td>India</td>
<td>35%</td>
<td>53%</td>
<td>51%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>20%</td>
<td>36%</td>
<td>80%</td>
</tr>
</tbody>
</table>

* Numbers are rounded up
Digital technology-led solutions are being developed and applied to overcome key constraints to financial inclusion

<table>
<thead>
<tr>
<th>Key objectives</th>
<th>Key constraints</th>
<th>Solutions via Digital Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KYC</strong></td>
<td>Make sure everyone has valid identification documents and a low-cost, accessible means of authentication</td>
<td>Globally, a lack of ID and necessary documentation makes it hard to open a bank account and access capital/credit</td>
</tr>
<tr>
<td><strong>Last mile solution delivery</strong></td>
<td>Ensure financial access and services extend to hard-to-reach populations</td>
<td>Limited number of ATMs/ bank branches and typically more costly both for customers and providers</td>
</tr>
<tr>
<td><strong>Affordable products/services</strong></td>
<td>Devise useful, affordable and relevant financial products, tailored to consumer needs</td>
<td>Overall, 59% of adults without a bank account cite lack of money as a key reason</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSMEs cite lack of collateral, absence of credit history and informal business practices as the main reasons for not having an account (Alibaba service)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of trust in financial service providers is one of the cited reasons for not having an account</td>
</tr>
<tr>
<td><strong>Security &amp; Customer Protection</strong></td>
<td>Establish robust financial consumer protection frameworks, and adapt relevant regulatory and supervisory authorities</td>
<td>Lack of trust in financial service providers is one of the cited reasons for not having an account</td>
</tr>
</tbody>
</table>

Sources: World Bank Official website, L’Atelier Analysis
Digital Financial Inclusion can address a significant part of unmet demands and contribute to national GDP growth…

<table>
<thead>
<tr>
<th>Benefits of Digital Financial Inclusion</th>
<th>Projected impact of Digital Financial Inclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inclusion in the financial system</strong></td>
<td>Estimated to address about 40% of the volume of unmet demand for payments services and 20% of the unmet credit needs in the Base of the Pyramid and MSME segments</td>
</tr>
<tr>
<td>• Digital stored-value accounts may provide easier access or a path into the financial system for the financially excluded, especially hard-to-reach populations</td>
<td></td>
</tr>
<tr>
<td><strong>New customers for core financial products</strong></td>
<td>The cumulative effect of digitally-driven acceleration in financial inclusion could boost GDP by 2-3% in markets such as Indonesia and the Philippines and in Cambodia</td>
</tr>
<tr>
<td>• Typically lower costs of digital transaction platforms: allowing customers to transact locally in irregular, tiny amounts</td>
<td></td>
</tr>
<tr>
<td>• Additional financial services tailored to customers’ needs and financial circumstances</td>
<td></td>
</tr>
<tr>
<td><strong>Risk mgmt. and security</strong></td>
<td></td>
</tr>
<tr>
<td>• Reducing the risks of loss, theft and other financial crimes posed by cash-based transactions; plus also reducing the costs associated with transacting in cash and using informal providers</td>
<td></td>
</tr>
</tbody>
</table>

... and is expected to impact a wide range of stakeholders – individuals, MSMEs, govts, FS providers – especially in Asia

Potential Impact of Digital Financial Inclusion globally

<table>
<thead>
<tr>
<th>Inclusion in the financial system</th>
<th>New customers for core financial products</th>
<th>Risk mgmt. and security</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Figure 3: Individuals Newly included in Financial System (%)</strong></td>
<td><strong>Figure 4: MSMEs &amp; Individuals – New Credit ($US Bn)</strong></td>
<td><strong>Figure X: FS providers – New deposits ($US Bn)</strong></td>
</tr>
<tr>
<td>South Asia: 33%</td>
<td>South Asia: 753</td>
<td>China: 32</td>
</tr>
<tr>
<td>Southeast Asia: 14%</td>
<td>Southeast Asia: 295</td>
<td>Southeast Asia: 27</td>
</tr>
<tr>
<td>China: 8%</td>
<td>Latin America: 455</td>
<td>Latin America: 10</td>
</tr>
<tr>
<td>Latin America: 25%</td>
<td>Africa/Middleeast: 448</td>
<td>Africa/Middleeast: 20</td>
</tr>
<tr>
<td>Eastern Europe: 11%</td>
<td>Eastern Europe/Central Asia: 197</td>
<td>Latin America: 12</td>
</tr>
<tr>
<td>Eastern Europe: 7%</td>
<td></td>
<td>Eastern: 9</td>
</tr>
</tbody>
</table>

Source: McKinsey Global Institute Analysis 2016 report
Digital Financial Inclusion solutions are developed through collective efforts by both the public and private sector

<table>
<thead>
<tr>
<th>Global Intergovt. Org.</th>
<th>Local Government</th>
<th>Traditional FIs</th>
<th>FinTech Players</th>
</tr>
</thead>
<tbody>
<tr>
<td>Put in place guidelines and offer advisory and technical assistance for establishing Digital Financial Inclusion solutions</td>
<td>Put in place an enabling regulatory and policy environment to allow banks and non-banks to innovate and expand access to financial services</td>
<td>Develop digitally-enabled banking services with lower thresholds and easy onboarding experience</td>
<td>Make use of alternative data and shared infrastructure in order to provide affordable and accessible banking services to un/underbanked populations</td>
</tr>
</tbody>
</table>

Public Sector
Governmental Organisations

Private Sector
Financial Services Providers
2.2. Case Study on Digital Financial Inclusion Initiatives in Asia
Asia leads on investment volume in digital finance; solutions for individuals and SMEs account for the major proportion

Figure 6: Volume of FinTech Venture Financing (2015-2016)

Unit: $US Bn

<table>
<thead>
<tr>
<th>Year</th>
<th>Asia-Pacific Region</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>5.2</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>11.2</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>9.2</td>
<td></td>
</tr>
</tbody>
</table>

Sources: CB Insights, Accenture, Citi Bank GPS report

Figure 7: Capital deployment in the FinTech Sector (2015)

<table>
<thead>
<tr>
<th>Category</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal/SMEs</td>
<td>73%</td>
</tr>
<tr>
<td>Asset Mgmt.</td>
<td>10%</td>
</tr>
<tr>
<td>Insurance</td>
<td>4.00%</td>
</tr>
<tr>
<td>Investment Banking</td>
<td>3.00%</td>
</tr>
<tr>
<td>Corporate Banking</td>
<td></td>
</tr>
</tbody>
</table>

Notes: X2

Figure: 5.2 to 11.2

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…impacting end-to-end financial inclusion – from lowering the entry barrier to upholding security

Digital Financial Inclusion Framework

1. Lowering the entry barrier
   - Customer side: Enabling easier access to financial services
     - e.g. Digital KYC
   - Supplier side: Enabling easier entry to financial services provision
     - e.g. Open APIs, Blockchain, Cloud computing

2. Offering necessary and affordable products
   - Offering basic to more sophisticated financial services
     - e.g. Bank Account, Payment, Financing, Savings, Insurance
   - Delivering financial services to the last mile
     - e.g. mobile phones as the service channel, mobile agents with digital devices, alternative PoS at retail stores such as convenience stores and pawnshops
   - Enablers for customized products for the un/under banked population
     - e.g. use of alternative data for credit scoring

3. Guaranteeing security
   - Monitoring abuses of the digital financial system and protecting customers’ rights
     - e.g. government regulatory support and guidelines for FinTech/ Cybersecurity, RegTech
# Digital Financial Inclusion Initiatives in Asia

## Lowering the entry barrier

- Digital ID Authentication for KYC
  - Aadhaar ID – iris scanning ID system in India

## Offering necessary and affordable products

<table>
<thead>
<tr>
<th>Payment</th>
<th>Financing</th>
<th>Insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last-mile payment/ money transfer solution</td>
<td>Inclusive digital financing for the under-banked by Ant Financial</td>
<td>Flexible and affordable digital insurance products</td>
</tr>
<tr>
<td>- Money wallet and alternative PoS by Coins.Ph in the Philippines</td>
<td>Credit scoring using alternative data for personal finance</td>
<td>- BIMA (Asia)</td>
</tr>
<tr>
<td></td>
<td>- Sesame scoring by Ant Financial in China</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Financing for rural farmers and micro-enterprises via Big Data credit scoring</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- My Bank, Ant Financial in China</td>
<td></td>
</tr>
</tbody>
</table>

## Guaranteeing security

- Customer data protection technology
  - Chinese government – systematic support for digital financial inclusion and regulations to prevent abuses of digital financial solutions
Digital KYC – Aadhaar ID – iris scanning ID system in India

“AADHAAR (‘Foundation’ in English) is a 12-digit unique-identity number issued to all Indian residents based on their biometric and demographic data

- The data is collected by the Unique Identification Authority of India, a statutory authority established in January 2009 by the Government of India
- More than 99% of the estimated population in India aged 18 and over had an Aadhaar number assigned (Aug. 2017)
- The system is built entirely on open standards and open source platforms so as to avoid vendor lock-in
- Aadhaar enrolment is not mandatory, and opinions have been expressed regarding data leakage and lack of privacy in India

Source: Unique Identification Authority of India

Enrolment in Aadhaar

Demographic Data
- Compulsory data
  - Name
  - Age
  - Date of Birth
  - Gender
  - Address

Optional Data
- Mobile number
- Email address

Biometric Data
- Photograph
- All 10 Fingerprints
- Both Irises

12-Digit Aadhaar Number
‘Unique, lifetime, biometrics-based Identity’

“‘The most sophisticated ID program in the world”
Paul Romer, World Bank Chief Economist
Aadhaar was introduced in order to overcome the barrier which identity proof represents for the poor in India. Aadhaar enables widely accessible authentication scheme for different services.

Key constraints in India for financial inclusion:

**Large number of hard-to-reach and base-of-pyramid residents**
- 640K villages, ~60% living on under $US2 per day
- Less than 3% of the population pay income tax, and less than 20% pay banking tax

**Absence of standard verifiable identity**
- $US50bn in direct government subsidies are paid every year, and most programmes are plagued with phantom claimants and multiple identities, causing leakage of 20~40%
- Various service providers had different document and information requirements, while Indian residents often lacked the necessary documentation

India’s vision of Aadhaar use cases:
- Digital signature & Electronic Documents
- Credit Registries
- Electronic Payment
- Mobile Commerce
- Insurance, Banking
- Govt. Services
- Citizen Portals & Contents

Source: Data from 2014 presentation by Dr. Varma of Unique Identification Authority of India
Aadhaar is being increasingly adopted by financial services providers in India to replace a traditional KYC scheme

Aadhaar is increasingly being adopted for authentication and eKYC...

...with financial services providers offering account opening and transaction services based on Aadhaar

Unit: One million times

Figure 8: Aadhaar authentication trend in 2017

<table>
<thead>
<tr>
<th></th>
<th>Dec-16</th>
<th>Q1 2017</th>
<th>Q2 2017</th>
<th>Q3 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>177.74</td>
<td>1058.56</td>
<td>1850.02</td>
<td>3482.41</td>
</tr>
</tbody>
</table>

Figure 9: Aadhaar eKYC trend in 2017

<table>
<thead>
<tr>
<th></th>
<th>Dec-16</th>
<th>Q1 17</th>
<th>Q2 17</th>
<th>Q3 17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>187.76</td>
<td>499.40</td>
<td>753.50</td>
<td>1135.89</td>
</tr>
</tbody>
</table>

Samsung India has launched Galaxy Tab Iris featuring iris-recognition technology ready for Aadhaar authentication applications such as banking, eGovernance services (passport, taxation, healthcare, etc)

- DCB Bank launched a service to allow customers to open bank accounts using iris scan for Aadhaar authentication using a DCB Bank ‘phablet’ device.
- On DCB ATM, cash withdrawals and other transactions can be made by using Aadhaar number and fingerprints
- The bank ran a pilot programme at around 10 branches in rural or semi-urban areas over the past three weeks, processing about 200 accounts, including opening 100 fresh accounts.

Source: DCB Bank Press Releases, Feb 2017

Data Source: Unique Identification Authority of India

Source: DCB Bank Press Releases, Feb 2017
Coins.Ph last-mile mobile payment solution in the Philippines

Coins.Ph is Southeast Asia’s leading mobile bitcoin blockchain-enabled platform, which enables those without bank accounts to easily access payment and remittance services

- Founded in 2014 by Silicon Valley entrepreneurs Ron Hose and Runar Petursson
- It offers online and offline mobile wallet load, payment, and cash in/out via a broad partnership network with merchants, major banks, telcos, and convenience stores
- Within 3 years, it has grown its customer base to 1M+
- Raised a Series A funding of $US5 million from Naspers (a major investor in Tencent Holdings)

Accessible
- Mobile number or email address to open an account, no need to have a bank account
- Last-mile solution by providing cashing in and out at 22K+ locations including 7 Eleven convenience stores.

Affordable
- No minimum cash in amounts
- No monthly fees charged on the account

Wide range of payment scenarios
- Supports online and offline (QR code) payment
- 80 types of bills including airtime, utilities, insurance and tuition
- Payments to 100K online merchants

Source: Coins.ph official website, Press Releases
Young demographic and high mobile penetration in the Philippines present opportunities for m-payment solutions

Although the Philippines currently has low bank account penetration...

...mobile wallet solutions like Coins.ph are rapidly filling the gap

Figure 10: Unbanked population (2014)

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Population</th>
<th>Account (% Age 15+)</th>
<th>Mobile penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mainland China</td>
<td>1.357 billion</td>
<td>79%</td>
<td>74% (50.9%)</td>
</tr>
<tr>
<td>India</td>
<td>1.252 billion</td>
<td>53%</td>
<td>75% (26.3%)</td>
</tr>
<tr>
<td>Philippines</td>
<td>98.39 million</td>
<td>15%</td>
<td>113% (36.6%)</td>
</tr>
</tbody>
</table>

(XX%): Smartphone penetration

The Philippines has a low account penetration due to the relatively high minimum balance requirement and small bank branch networks. The country’s high mobile penetration and a large proportion of mobile native millennials in the population (median age: 23.4 yrs old, 2010) present an opportunity for mobile wallet services

Source: World Bank, 2014 data /Philippines Statistics Authority
Offering Necessary and Affordable Products

**Coins.ph offers a last-mile payment solution to local residents without the need for a bank account...**

End-to-end online-to-offline payment/money transfer service by Coins.ph

### Account opening
- Mobile phone
- Network

### Cash in
- Coins.ph account
- Mobile phone
- Network

### Payment
*Additional KYC documents such as online ID verification, uploading of photograph with ID etc. are required for larger deposits or transactions

### Money Transfer
- Bitcoin transfer via Coins.ph application, wallet-to-wallet transactions

### Cash out
- Other mobile money wallets

#### Channels

**Online**
- PC
- Mobile
  - Gcash (Mobile payment by Globe telco)

**Offline**
- Convenience store (7-Eleven)
- Pawnshop (Cebuana, M Lhuillier)

**Online**
- Partner e-commerce (Payment API)
  - Various bill payment menus within the app

**Offline**
- Partnering offline retailers, payment via QR code scanning

**Online**
- Cardless ATM, instant payout (24/7)
- Bank branches (BPI, EastWest Bank...)
- Cash Card (Smart-telco- Money card...)
- Cash Pickup at pawnshops
Due to a lack of bank accounts and high fees, OFWs depend on informal channels for remittances. Catering to OFWs’ needs, Coins.Ph provides a remittance and fiat currency cash-out service.

Figure 11: Breakdown of the remittance methods of OFWs in 2016

<table>
<thead>
<tr>
<th>Category</th>
<th>Cash sent</th>
<th>Cash brought home</th>
<th>In kind</th>
<th>Total Remittances</th>
<th>Total Cash Remittances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banks</td>
<td>60.3%</td>
<td>22.5%</td>
<td>5.5%</td>
<td>202,917 m Pesos</td>
<td>146,029 m Pesos</td>
</tr>
<tr>
<td>Others</td>
<td>39.7%</td>
<td>77.5%</td>
<td>90.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remittances through unofficial channels (agencies, door-to-door, friends, etc.), including illegal channels, account for 30-40% of total.

Source: Philippine Statistics Authority (Data release in April 2017)

Catering to OFWs’ needs:

1. Remittance via mobile bitcoin wallet:
   Allows transactions at lower fee and with shorter clearing/settlement period than the local bank

2. Cash-out at offline channels:
   Cardless withdrawals at partnering bank ATMs/ pawnshops/convenience stores

Financial support for the family back home:
- Total number of OFWs estimated at 2.2 million (2016)
- Most OFWs’ family members rely on the OFW’s income
- Low personal savings among the local population puts them in a vulnerable situation at a time of emergency (medical, large bills, natural disasters etc.)
Offering Necessary and Affordable Products

Digital Financial Solutions have greatly contributed to the financial inclusion of under-banked provinces in China...

The introduction of digital financial solutions greatly improved financing penetration in provinces with concentrations of 3rd- and 4th-tier cities versus 1st-tier cities such as Shanghai.

Figure 12: Digital credit financial services Index in Mainland China, by province

Source: Beijing University Publication
Offering Necessary and Affordable Products

... and Ant financial has played a significant role in the rapid growth in Internet financing offers

Digital financial services have achieved exponential growth in the past several years in China...

Figure 13: Volume and growth rate of Internet Credit Balance in China 2013-2016e (Unit: 100 million RMB)

... led by Internet giants such as Ant Financial

Figure 14: The level of Internet Credit Balance volume by FinTech player in China, 2015 (Unit: 100 million RMB)

Source: iResearch, 2016 * Numbers are rounded up / Official announcements by each player
Ant Financial Services Group is an affiliate company of the Chinese Alibaba Group*, which owns 33% of Ant Financial. It is the most valuable FinTech company in the world, with a market valuation of $US50bn in 2016.

- It was established in October 2014, rebranded from Alipay (founded in 2004)
- It provides extensive products covering individual and MSME financial needs including payment, investment, financing and insurance
- It launched an Internet-only bank catering for MSMEs called ‘My Bank’ in 2015
- Its payment product Alipay is the world’s biggest third-party payment service, with 451 million active users

*China’s biggest online services provider, founded by Jack Ma in 1999/ Source: Ant Financial published company reports (2016)
Ant Financial leverages the favorable market conditions and massive user base from its e-commerce and payment services

### Factors for Internet players’ prosperity in the Financial Services Market in China

<table>
<thead>
<tr>
<th>Favorable market situation</th>
<th>Upper hand in user-base and data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growing Internet and Mobile penetration</td>
<td>Massive customer base</td>
</tr>
<tr>
<td>- &gt;731m Internet users and 659m mobile Internet users, i.e. 53.2% and 47.9% penetration respectively</td>
<td>- 439m annual active buyers on Alibaba’s China retail marketplaces</td>
</tr>
<tr>
<td>- The average number of credit cards owned per person was 0.31 in 2016 Q2 (2.24 in the U.S. at end 2015).</td>
<td>- Customers expect Internet player-level convenience for financial services</td>
</tr>
<tr>
<td>- Small and micro-enterprises accounted for 32.1% of the total corporate loan balance at end 2016.</td>
<td>- Alibaba offers a sticky experience and encourages customer loyalty by building a digital ecosystem for different life scenarios</td>
</tr>
<tr>
<td>- Govt. encouraging FIIs and Internet companies to invest in innovative financial solutions</td>
<td>- Massive data on users’ daily consumption and behaviour</td>
</tr>
<tr>
<td>- Policies promoting healthy development of Internet finance</td>
<td>- Improving risk mgmt. ability, using Big Data and Artificial Intelligence technology.</td>
</tr>
</tbody>
</table>

### Source
CNNIC, PBOC, Ant Financial Report, L’Atelier Analysis
Ant Financial’s inclusive digital financial services in China

<table>
<thead>
<tr>
<th>Product</th>
<th>Feature</th>
<th>Key Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sesame Credit</td>
<td>Credit Scoring using Alternative Data used for the consumer credit reference</td>
<td>130 million cumulative users for the reference</td>
</tr>
<tr>
<td>My Bank – Wang Nong Dai</td>
<td>Digital loan products for farmers and rural people</td>
<td>-</td>
</tr>
<tr>
<td>My Bank - Wang Shang Dai</td>
<td>Micro-loan products to micro- and small-sized e-commerce merchants</td>
<td>3 million cumulative users</td>
</tr>
</tbody>
</table>

Source: Ant financial company published reports (2016) – non-exhaustive list
Offering Necessary and Affordable Products

Sesame credit scoring by Ant Financial in China (1/2)
Collecting and assessing 200+ data points including Alipay transactions and assets

Example of a user’s Sesame score

Break-down of parameters used in Sesame scoring

- Sesame scores are indications of the user’s creditworthiness, ranging from 350 to 950 points.
- Users can check their Sesame scores both in the Alipay Wallet mobile app and through merchant websites that accept Sesame credit services.
- The scores are calculated using five different factors, each with different weightings, which can vary according to individual profiles.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credit History</td>
<td>Reflects a user’s past payment history and indebtedness, for example on credit cards</td>
</tr>
<tr>
<td>Behavior and Preference</td>
<td>Reveals a user’s online behaviour on the websites s/he visits, the product categories they shop, etc.</td>
</tr>
<tr>
<td>Performance - Fulfilment Capacity</td>
<td>Shows a user’s ability to fulfil his/her contractual obligations. Indicators include use of financial products and services and Alipay account balances.</td>
</tr>
<tr>
<td>Personal Characteristics</td>
<td>Examines the extent and accuracy of personal information, for example home address and length of time of residence, mobile phone numbers, etc.</td>
</tr>
<tr>
<td>Connections/ Interpersonal Relationships</td>
<td>This parameter reflects the online characteristics of a user’s friends and the interactions between the user and his/her friends.</td>
</tr>
</tbody>
</table>
Sesame credit scoring by Ant Financial in China (2/2)

The score applied as a reference for consumer loan approval offered by Ant Financial

Users can choose what kind of payment method they prefer. **HUABEI** consumer credit product offered by Ant Financial is displayed at the top among other options.

*Huabei (virtual credit card): 15% per annum (credit card)/Min 1K~Max 50K
Wang Nong Dai, Farmer loan by Ant Financial in China
Providing a last-mile loan solution for farmers by using mobile agents and alternative data

Service Channel:
Using mobile agents with wireless devices

The farmer visits ‘Rural Taobao Service Centers’ (Alibaba is planning to build 100K village-level outlets nationwide) to apply for a loan. The service agent assists farmers with the onboarding via a wireless terminal. When applying for loans, Internet banking will be verified in real time after the loan. This solution has solved the problem of a shortage of bank branch networks in the rural areas of China.

Credit Scoring:
Leveraging alternative sets of multi-dimensional data

In setting the credit limit, My Bank assesses the farmer’s assets (livestock, tools, etc.), online shopping records, past bank loan history, debt situation, and also his/her reputation in the village.

Wang Nong Dai is a digital financing product for farmers in China developed by Ant Financial’s My Bank

- Provides loans to under-banked farmers in rural areas
- Loans of up to RMB 500K may be granted, without collateral or the need to provide guarantees for the loan period of 6 months, 12 months and 24 months
- The loan interest rate (0.016%/day to 0.047%/day) depends on the farmer’s credit score
- The service extends to over 16,500 villages and 27 provinces in China (2016)

Source: Alibaba/Ant financial Press Releases
Wang Shang Dai, MSME loan by Ant Financial in China (1/3)
Catering to underserved MSMEs by leveraging Big Data capability

MSMEs’ underserved financial needs
- MSMEs represent 97% of all businesses in China
- Loan volume growth 09-13: Total business loans (up 176.5%) versus SME loans (up 209.9%)
- 54.5% of SME bank loans with collateral requirement

Systematic government support
- Government’s ‘Five-Year Plan’ (2016) encouraging SME financing
- Promoting SME credit system and information-sharing

Ant Financial’s SME Data capability
- Transaction data collected from SME e-commerce merchants (Alibaba)
- Big Data for working capital needs and credit eligibility analysis
- Development of a Financial Cloud

Opportunities for serving SMEs

Growth potential for Internet finance for SMEs

Sources: OCED Report, Chinese Government announcement, L’Atelier Analysis
### Ant financial micro credit loan offers to SMEs

**Target Customer**
- Micro- and small-sized merchants on e-commerce under Alibaba group
- Other small business owners meeting set loan qualifications

**Service Channel**
- My Bank Internet Bank of Ant Financial
- Alibaba B2B E-commerce
- Taobao C2C E-commerce

**Products**

<table>
<thead>
<tr>
<th>Loan Type</th>
<th>Ali Credit</th>
<th>High-Speed</th>
<th>Quick Payback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. loan amount</td>
<td>RMB 1m</td>
<td>RMB 1m</td>
<td>RMB 0.5m</td>
</tr>
</tbody>
</table>

**Risk Management**
- Online risk model; Mining of online data
- Ali finance had a NPLR ratio of 0.87% in 2013, compared with between 5.5%-6% for commercial banks

**Features**
- Max. loan period 1yr
- Min. interest rate 0.038%
- Funds to the customer account within 1 day
- Max. loan period 15 days
- Min. payback commission RMB2.5

Source: Ant Financial Press Releases

Details on the following page

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**Wang Shang Dai, MSME loan by Ant Financial in China (2/3)**

Offering multiple products via multiple channels catering to diversified MSME credit needs

---

### Offering Necessary and Affordable Products

**“Small amount, Short period, No collateral”**

- ‘VIP-Client-Only Service’
- ‘Pure – Online loan service’
- ‘Loans against order receivables’
Wang Shang Dai, MSME loan by Ant Financial in China (3/3)
Low NPL without collateral requirement achieved by leveraging Big Data capability

Data set applied to Chinese SME supplier credit scoring

Existing Big Data base

Data sourced from Alibaba ecosystem

<table>
<thead>
<tr>
<th>E-commerce</th>
<th>B2C/C2C/ B2B (Alibaba)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment</td>
<td>Alipay</td>
</tr>
<tr>
<td>Business network</td>
<td>Wangwang, Laiwang</td>
</tr>
<tr>
<td>Video</td>
<td>Youku</td>
</tr>
<tr>
<td>Browser</td>
<td>UC Web</td>
</tr>
<tr>
<td>Search</td>
<td>Yitao</td>
</tr>
<tr>
<td>Game</td>
<td>Ali-game</td>
</tr>
<tr>
<td>Music</td>
<td>Xiami music net</td>
</tr>
<tr>
<td>Travel</td>
<td>Qiongyou Net</td>
</tr>
<tr>
<td>Map</td>
<td>Gaode Map</td>
</tr>
<tr>
<td>Logistics</td>
<td>Cainiao</td>
</tr>
<tr>
<td>National ID</td>
<td>Payment/E-commerce acct.</td>
</tr>
</tbody>
</table>

E-commerce data

- Business info – official registration, address, contacts
- Ongoing sales/purchases
- Historical transaction data
- Client feedback
- Client recommendations
- Logistics data

Alipay data

- National ID info
- Assets under Alibaba or affiliate’s Wealth Mgmt. account
- Payment, Money, Transfer record

Implications

- ID authentication
- Fund Flow
- Wealth
- Revenue
- E-commerce creditworthiness
- Judge Sales record, Check address
- Operations, healthiness, etc.

Loan Rejection or Approval

Source: Company data, Gao Hua Securities Research

Ali-Cloud Data Analytics
(Over 30 Petabytes every day)
BIMA, mobile-delivered insurance in emerging Asian markets

BIMA provides an affordable pay-as-you-go insurance and health products that can be bought via a mobile air-time fee. It operates in emerging markets in Asia and Africa.

- BIMA was founded in April 2017 in Stockholm
- It raised $US82.2m in 4 rounds from six investors and gathered 24m customers with a 50% active base
- Developed a bespoke portfolio of over 40 micro-insurance and mobile health products

Source: BIMA official site, Crunchbase

Reaching out to the Base of the Pyramid

- 90% of the customers buying insurance for the first time via BIMA, and 93% of all BIMA customers, live on less than $US10 a day
- The average insurance premium is $US0.02 per day and it takes ~3 days for claims to be paid out

Last-mile service channels

- BIMA makes use of mobile agents to on-board residents of rural and hard-to-reach areas
- The insurance is distributed via partnerships with mobile operators, microfinance providers & banks and other corporates and consumer outlets
- Customers can apply for insurance via SMS and pay for it using pre-paid airtime credit or post-paid billing
# Systematic support and regulatory guidelines for digital financial inclusion from the Chinese government

**History of Financial Inclusion initiatives by Chinese government (2012-2016)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2012</td>
<td>Previous Chairman Hu Jintao referred to Financial Inclusion at the G20 summit in Mexico – the first time a top Chinese leader had mentioned <strong>Financial Inclusion</strong> in a public speech.</td>
</tr>
<tr>
<td>Nov 2013</td>
<td>The Party’s central committee approved an important document entitled “Decision of the Central Committee of the Communist Party of China on Some Major Issues Concerning Comprehensively Deepening the Reform”. The document clarified China’s intention to develop Inclusive Finance on a national scale.</td>
</tr>
<tr>
<td>Jan 2015</td>
<td>CBRC established a Financial Inclusion department under the committee to <strong>oversee micro-finance, micro-loans, P2P lending</strong> and issues regarding agriculture, farmers and rural areas.</td>
</tr>
<tr>
<td>Jan 2016</td>
<td>The State Council issued a circular and drew up a five-year plan to develop Inclusive Finance in China. The goal of the five-year plan is to set up an inclusive financial system in coordination with the construction of a moderately prosperous society by 2020 and to satisfy people’s (including MSMEs’) needs for financial services.</td>
</tr>
</tbody>
</table>

Source: CBRC Official site, Lend Academy

*Further details on the following page*
Guaranteeing Security

To combat fraudulent platforms, CBRC* published draft regulations to increase the transparency of P2P platforms.

Increasing number of fraudulent P2P platforms necessitated the drafting of stricter regulations.

Figure 4: Number of problematic P2P platforms

In Dec 2015, draft regulations were published calling for more transparent management of P2P platforms.

Requirements on platforms, including stronger security and guarantee measures, will increase.

Players with a trustworthy name in the industry are likely to take a leading position in the market.

In February 2016, E-Rent Treasure, an online financial platform, used a ‘Ponzi scheme’ to illegally collect up to RMB 50 billion in funds, harming 900,000 investors in China.

Source: China Daily, CBRC Official Site, L’Atelier Analysis

*CBRC: China Banking Regulatory Commission
03
Tech for a Better Future: The Green Economy
3.1.
Overview of the Green Economy and the Impact of Emerging Technologies in Asia
Achieving sustainability requires a shift to the use of renewable resources and improvements in resource use efficiency

The term ‘Green Economy’ was first coined in a pioneering 1989 report commissioned by the UK government, entitled ‘Blueprint for a Green Economy’.

**Definition**
In The Green Economy Report released in 2011, UNEP* defines a ‘green’ economy as “one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low-carbon, resource-efficient, and socially inclusive.”

---

Three pillars of the Green Economy

- **Social**
  - Equitable
  - Bearable

- **Economic**
  - Sustainable
  - Viable

- **Environmental**

---

* United Nations Environment Programme
Traditional natural resource economies create global challenges resulting in a number of social and economic issues

**Population explosion**
- The world population grew at an unprecedented rate in the 20th century, reaching 6.1 billion in 2000.
- It will keep increasing and is expected to rise to 8.6 billion by 2030 and to stand at 9.8 billion in 2050.

**Environment issues**
- Excessive emissions of greenhouse gases and other untreated contaminants cause a range of environmental problems such as climate change, water pollution, desertification and loss of biodiversity.

**Resource shortages**
- Water: the UN predicts that the world water supply will fall short of need by at least 40% from 2015 to 2030.
- Land: Arable land per capita decreased by 46.6% from 1964 to 2014.
- Energy: Fossil fuels are finite; e.g. oil reserves are forecast to run out in around 50.7 years.

Asia is facing more serious challenges as a result of its overpopulation and pollution problems

Asia is the world's most populous continent…

Asia population proportions*:

59.6% of the world’s population live on 29.9% of the land surface

Asia land area proportions:

… with a huge burden of pollution

Location of monitoring stations and PM$_{2.5}$** concentrations, 2008-2015

*Asia population proportion: Data up to 2016

**PM$_{2.5}$: Fine particulate matter of 2.5 microns or less

Source: World Bank, World Health Organisation Ambient Air Pollution Report
Five sectors closely related to the environment and economy

- In its 2011 Green Economy Report, UNEP classified sectors under the green economy into two categories:

<table>
<thead>
<tr>
<th>Classification by UNEP</th>
<th>Selected sectors by L’Atelier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sectors derived from natural capital</td>
<td>Agriculture → Green Agriculture</td>
</tr>
<tr>
<td>- These sectors produce products from natural resources including geological formations, soil, air, water and all living organisms.</td>
<td></td>
</tr>
<tr>
<td>- They have a material impact on the economy as they form the basis for primary production, and because the livelihoods of the rural poor depend directly upon them.</td>
<td></td>
</tr>
<tr>
<td>Sectors derived from ‘built’ capital</td>
<td>Energy → Renewable energy</td>
</tr>
<tr>
<td>- These sectors are usually regarded as ‘brown’ sectors, but in fact they present sizeable opportunities for energy and resource savings.</td>
<td></td>
</tr>
<tr>
<td>- If these savings opportunities are scaled up, they can become drivers of economic growth and employment</td>
<td></td>
</tr>
<tr>
<td>Transport → Green transportation</td>
<td></td>
</tr>
<tr>
<td>Building → Green buildings</td>
<td></td>
</tr>
<tr>
<td>Waste → Waste management</td>
<td></td>
</tr>
</tbody>
</table>
The world is experiencing a revolution in emerging technologies

- Emerging technologies, such as Artificial Intelligence, 3D printing and the Internet of Things, are gradually becoming part of people’s lives through their various applications in consumer products.
- The trend is towards more production sectors adopting these technologies in order to resolve pain points and improve efficiency.

Technologies

- Internet of Things
- Big Data
- Mobile Internet

Use cases

- Smart appliances
- Shopping recommendation
- Mobile payments
- Industrial sensors
- Process optimisation
- Supply chain management
These technologies can bring significant benefits to the Green Economy

Emerging technologies can provide benefits in a number of areas...

- **Early pollution detection**
  - Monitor and quantify pollutant emissions
  - Pinpoint pollution sources faster and more accurately

- **Resource conservation**
  - Improve the production and resources use efficiency
  - Reduce the usage and prevent wastage

- **Sustainability development acceleration**
  - Reduce risks through more accurate prediction
  - Facilitate optimisation and future planning

... and more companies are investing in these activities

*Number of companies which mention AI in CSR (Corporate Social Responsibility) reports and CDP (Carbon Disclosure Project) filings*

Source: Esgtrends.com

“AI applications for sustainability are still at an early stage, but the data suggests they can bring significant benefits in the medium term”

- Conor Riffle, Co-founder of ESG Trends
3.2. Case Study on Green Economy Technology Initiatives in Asia
3.2.1.
How IoT is promoting the Green Economy
Two factors driving the application of new tech in the renewable energy industry in China

Technical limitations in the renewable energy industry unresolved

- **Diffusion**: Although renewable energy resources (RES) are essentially boundless, energy capture efficiency is not high
- **Intermittency**: As RES are highly dependent on weather conditions (e.g. wind speed and direction), it is difficult to ensure stable and efficient power generation

Increasing market demand for ‘green’ energy in China

- **Renewable power**\(^1\) is the fastest-growing energy sector, with a 14.1% increase in overall energy consumption in 2016
- **China is the largest renewable energy consumption market** with a 20.5% global share in 2016.
- With the shift towards a lower carbon component in the energy mix, RES are expected to account for 11% of China’s total energy consumption by 2035, compared with 2% in 2015

Support from new technology

Note: ‘Renewable energy’ refers to the energy which is collected from renewable resources including sunlight, wind, rain, tides, waves and geothermal heat
Source: BP Statistical Review of World Energy 2017
Energy IoT being used in Envision’s smart wind turbine

Envision Energy is a China-based wind turbines, energy management software and energy technology services provider. The company ranks No. 2 in China in the wind turbine market in terms of installed capacity (2016).

- Each turbine is armed with 150 sensors that track a variety of attributes including vibration, temperature, wind speed, etc.

Monitor & Control system
Real-time monitoring of turbine performance. Integrates data from weather and terrain maps, and calculates necessary adjustments to turbines in order to maximise output.

Predict & Optimise system
Detects equipment wear-and-tear so as to enable preventive maintenance.

Source: Chinese Wind Energy Association
Intelligent sensors in Zero Energy Buildings (ZEB) make automatic adjustments according to the environment

- The ZEB in Singapore, located at Singapore’s Building and Construction Authority (BCA) Academy, is retrofitted from an existing building
- The ZEB began operating entirely on solar power in 2009; the building is the first of its kind in South-East Asia

**ZEB has three sections**

- **Zone #1 Visitor Centre**
- **Zone #2 The Solar Energy Panorama**
- **Zone #3 The Office of the Future**

**A range of sensors are installed in the ‘Office of the Future’**

- **CO2 Sensors**
  Installed inside rooms, the sensors serve to regulate the amount of fresh air provided by triggering the speed control of the fresh air fan

- **Motion Sensors**
  Activation of light and fans based on detection of occupant movement and activity

- **Daylight Sensors**
  Detection of sufficient daylight will result in automatic reduction in artificial lighting so as to optimise energy consumption
Ecube provides data-driven waste management solutions

- Ecube is a Seoul-headquartered tech company founded in 2011. The firm provides cities and waste collection organisations with both IoT devices and data analysis systems in order to optimise waste collection operations.

### Internet of Things device

- **Clean CUBE** is a smart solar-powered trash compactor bin that compresses garbage and collects bin information such as fill-level and operating status.

- **Clean CAP** is a smart ultrasonic fill-level sensor that can be installed on any type of container so as to monitor different types of substances.

### Sensor data

### Data analysis system

- **Clean City Networks (CNN)** is an integrated cyber-physical system with both web and mobile application versions. It turns real-time data from Clean CUBE and Clean CAP into actionable intelligence, and enables users to plan waste collection route and schedules.
3.2.2. How Big Data is promoting the Green Economy
China’s great achievements in crop production growth have come at the expense of the environment

1. Limitations in planning and technology
   - The excessive number of agricultural land boundaries leads to land waste, and is not conducive to intensive and large-scale farming
   - The level of agriculture technology – including biological, mechanical, and information technology – is rather low

2. Overuse of fertilizers and pesticides
   - The consumption of fertilizer and pesticides in China has increased dramatically over the last 40 years because of changes to the cropping system and increases in demand for crops
   - Compared with world average figures, China consumes >4 times the amount of fertilizer and ~3 times the amount of pesticides\(^1\)

3. Irrational agricultural residue disposal method
   - Although the government has encouraged ‘greener’ disposal methods for crop straw, a significant number of farmers still burn straw due to convenience and cost concerns

---

Footnotes:

\(^1\) Data from 2014

Source: The World Bank, the United Nations Food and Agriculture Organisation
GAGO uses Big Data to improve agriculture management

- GAGO is a Beijing-based tech company which serves the agriculture, environment and finance sectors. It provides Big Data analysis services and visualisation systems.

Data collection from satellites and drones

1. Planning
   - Analyses historical data on the fields (production, pests & disease), combines climate, soil and crop data and provides suggestions for planning
   - Maximises the land value

2. Cultivation
   - Draws on climate, temperature and humidity information to predict the risk of pests and diseases and guide field irrigation
   - Promotes proper irrigation and pesticide use

3. Waste Disposal
   - Detects and monitors information on straw burring
   - Supports environmental supervision
Mobike is improving efficiency with its Big Data assistant

- Mobike is the well-known bike-sharing brand, which covers more than 130 cities in China and overseas.
- In April 2017, Mobike launched ‘Mo Fang’, a Big Data platform for data integration and analysis.

**Data collection**

**Internal data**
- Location
- Path
- Ride duration
- Bike type
- User

**External data**
- Time
- Weather
- Road conditions
- Site

**Operation optimisation**

- Supply prediction
- Parking recommendation
- User behaviour & preference

**Urban planning**

- Road planning for urban cycling
- Urban traffic planning
3.2.3. How Mobile Internet is promoting the Green Economy
China Internet-based transportation companies provide an alternative solution, with greater focus on ‘green’ transport

How alternative solutions are meeting market needs and how green they are

Traditional transportation
- Private car
- Metro & bus

Alternative transportation
- Car rental
- Car-sharing
- Ride-hailing
- Bike-sharing

>85% (29 out of 34) car sharing companies provide new-energy vehicles

Breakdown of motor vehicle travel mileage in Beijing and Shanghai

Beijing
- 35% 21% 20% 17% 7%

Shanghai
- 34% 20% 20% 17% 9%

EvCard provides a green and fully mobile-based sharing solution for drivers

- EvCard is a Chinese B2C car-sharing company launched in Shanghai by the SAIC Group in 2015. It is China’s first electric vehicle rental service. As at July 2017, EvCard had more than 10,000 cars operating in 31 Chinese cities, serving 1.2 million subscribers.

Eco-friendly

- **Average annual gasoline saving**: 700 litres
- **Average annual CO₂ emissions reduction**: 1.7 tons

Efficient

- **Average daily use duration**: 6.5 h for shared car vs. 1.5 h for private car (4 times longer)

Inclusive

- **Cost comparison per km**
  - Roewe E50: Cost of purchasing 1.33 RMB/km, Cost of car-sharing 0.60 RMB/km

Note 1, 2, 3: Data on all shared cars in China

Note 4: Pricing from EvCard

Sources: Ministry of Industry and Information Technology, State Information Centre, TOGO Big Data platform, Autohome
Home energy management system (HEMS) from Sekisui House

• Sekisui House, one of Japan's largest homebuilders, launched in 2013 the Green First Zero initiative, which aims to provide comfortable and environmentally-friendly living spaces.

• By cooperating with IBM Japan, Ltd., they have established a HEMS platform designed to facilitate centralised data management.

**Green First Zero Model:**

- The house generates energy with a capability-improved photovoltaic system
- The house reduces energy consumption through the installation of heat insulation and high-efficiency equipment

**HEMS App:**

- To monitor and visualise your energy consumption and savings
- Access to useful information (such as gardening tips and security information)
Enwise optimises waste transformation with real-time monitoring

- Enwise is a Chinese-French joint venture founded in 2012. The company produces modular and connected organic waste digesters for the food distribution sector and other industries.

### Traditional flow

- Waste production
- Sorting
- Energy transformation
- Energy transportation
- Energy consumption

### Optimised solution from Enwise

1. **Improves efficiency with a simplified flow**
   - Waste production
   - Onsite organic digester
   - Energy consumption

2. **Adds measurability by connecting with the app**
   - Equipment performance
   - Waste volume treated & energy produced
   - Remote control
   - Predictive maintenance
   - Return-on-investment reporting
3.3.
Appendix
Table: Industry sector and type of new technology applicable to each case

<table>
<thead>
<tr>
<th>Sector</th>
<th>Case</th>
<th>Country</th>
<th>IoT</th>
<th>Big Data</th>
<th>Mobile Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Agriculture</td>
<td>GAGO</td>
<td>China</td>
<td>▲</td>
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Research date: November 2017
Thank you!
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