



Spectrum auction failure and how to avoid it

Stefan Zehle
CEO, Coleago Consulting Ltd
+44 7974 356 258
stefan.zehle@coleago.com

www.coleago.com



About Coleago Consulting

A specialist telecoms management consulting firm



Since 2001, Coleago has offered a wide range of advisory services to the telecom industry

Strategy & Business Planning

- Strategy Development, Marketing Strategy
- MVNO and Multi-Brand Wholesale Strategy
- Business Planning and Business Modelling

Telecoms Regulation & Interconnect

- Accounting Separation, Regulatory Price Control
- Interconnect Cost Modelling, RIO
- Regulatory Consultations

Spectrum Valuations and Auctions

- Spectrum Strategy
- Spectrum Valuation for Auctions
- Spectrum Auction Bid Strategy and Execution
- Beauty Contest Bid Books

Transaction Services

- Commercial Due Diligence
- Tower Due Diligence
- Preparation of Information Memorandum

Mobile Network Sharing

- Mobile Network Sharing
- Managed Services and Outsourcing
- Tower Due Diligence
- Network Audit

Business Transformation & Cost Reduction

- Cost Reduction
- Mobile Network Sharing
- Restructuring and Turnaround



Coleago has carried out over 90 spectrum consultation, valuation, auction and beauty contest licence projects

Completed in 2017-18

- Denmark – 700 and 3500MHz
- Canada – 600MHz
- Ukraine – 1800, 2600MHz
- Paraguay – 700MHz
- Malaysia – 700MHz
- Nepal – 700, 2600MHz
- Myanmar – 1800MHz
- Bangladesh – 700, 1800, 2100, 2300, 2600MHz
- Indonesia – 2100, 2300MHz
- Cambodia – 2600MHz
- South Africa – 800, 2600MHz

Ongoing in 2019

- Slovenia - 700 and 3500MHz
- Slovakia - 700 and 3500MHz
- Belgium - 900, 1800, 2100MHz renewal and 700, 1500, 3500MHz



Spectrum auction failures



Potential policy objectives in spectrum assignment

1. Revenue

Maximise government revenue extraction from the mobile industry

2. Value

Promote the highest value use of spectrum

3. Efficient use

Ensure spectrum is deployed and the spectral efficiency is maximised

4. Good service

Ensure that customers benefit from good services

5. Competition

Ensure a sustainable competitive mobile market

6. Coverage

Promote rural broadband access and increase digital participation rates

7. Economic benefit

Provide a high net economic return to the public

8. Investment

Promote network and service investment and innovation

What constitutes a failed spectrum auction?

- A failed auction is an auction outcome where most or all of the objectives have not been attained
- The most glaring failure is not to sell the spectrum that was put up for sale, but this is by no means the only failed outcome



1. Revenue

2. Value

3. Efficient use

4. Good service

5. Competition

6. Coverage

7. Economic benefit

8. Investment



Examples of failed spectrum auctions

India, Bangladesh, Ghana



Ghana: The 800MHz auction in Ghana in December 2015 resulted in only one LTE operator



Ghana 2015 800MHz auction

- 2 lots of 2x10MHz of 800MHz offered via auction
- Reserve price of US\$ 67.5 million per lot
- Existing spectrum is not technology neutral

MTN became the sole LTE operator

- MTN acquired 2x10MHz for US\$67.5 million (US\$ 0.13 / MHz / pop)



Failure to achieve policy goals

- Auction revenue target not met
- Unsold spectrum means spectrum lies fallow
- Competition issues have arisen
- Future policy challenges in assigning the remaining spectrum and licence renewal

1. Revenue	2. Value
3. Efficient use	4. Good service
5. Competition	6. Coverage
7. Economic benefit	8. Investment



- Flawed use of benchmarking to set reserve price.
- The reserve price was hugely excessive – by a factor of 5 or more.
 - The regulator had been told that at that price operators, other than MTN, would not have business case but did not listen.
- Did not consider the financial situation of the industry where only MTN was cash flow positive and all other had negative equity.
- Did not take account of upcoming licence renewal and the uncertainty this created.



The October 2016 spectrum auction in India ended in failure as none of the 700MHz spectrum was sold



- Massive failure to reach the revenue target from the sale of spectrum:
 - Based on advice from TRAI, the Government of India planned to raise Rs 536,239 crores (US\$ 80 bn) but only raised 12% of the target (Rs 65,789 crores / US\$ 10 bn).
- Failure to deliver wide area LTE coverage
- Negative consequences for mobile users
- A blow to ICT development in India
- Failure to deliver National Telecoms Policy 2012

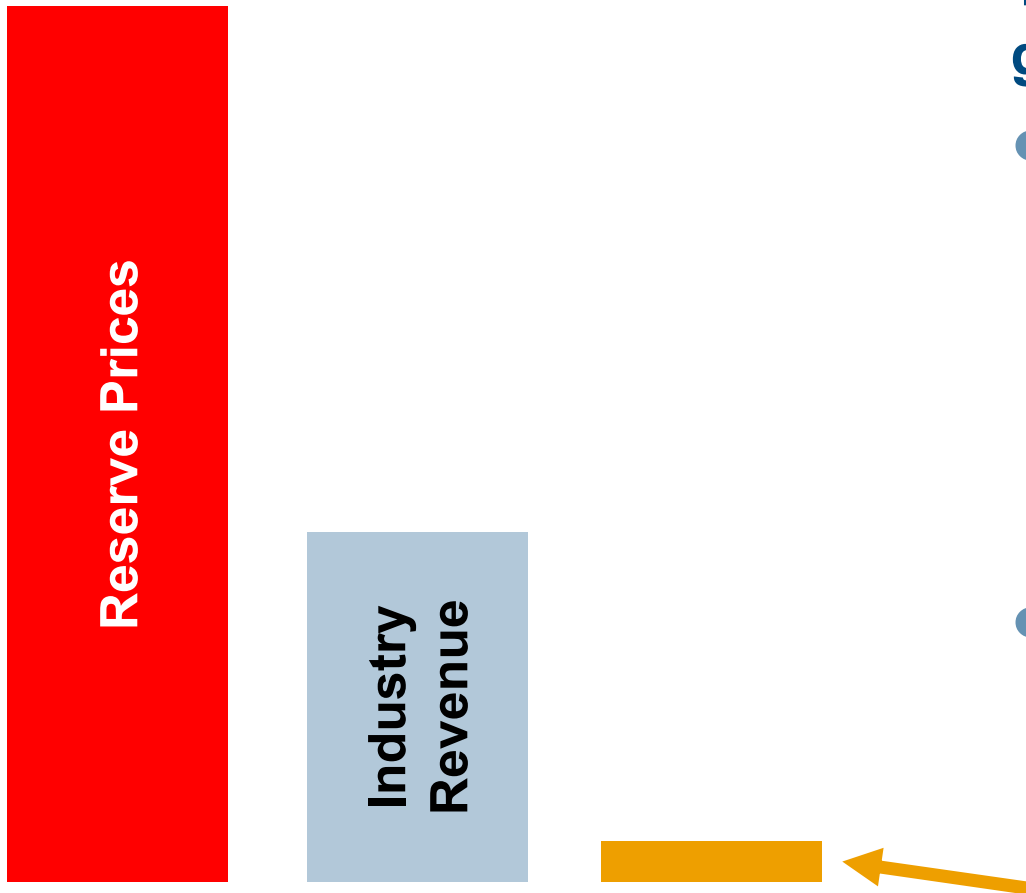


1. Revenue	2. Value
3. Efficient use	4. Good service
5. Competition	6. Coverage
7. Economic benefit	8. Investment

The reserve prices for 700MHz were out of proportion to the cash generated by the Indian mobile industry



Where will the cash come from?



The reserve prices for 700MHz set by TRAI are out of proportion to the cash generated by the Indian mobile industry

- The reserve prices of INR 5,362 billion is equivalent to:
 - Over twice the annual industry revenue
 - 22 years' worth of operating free cash flow
- Reserve prices would need to be 90% lower.

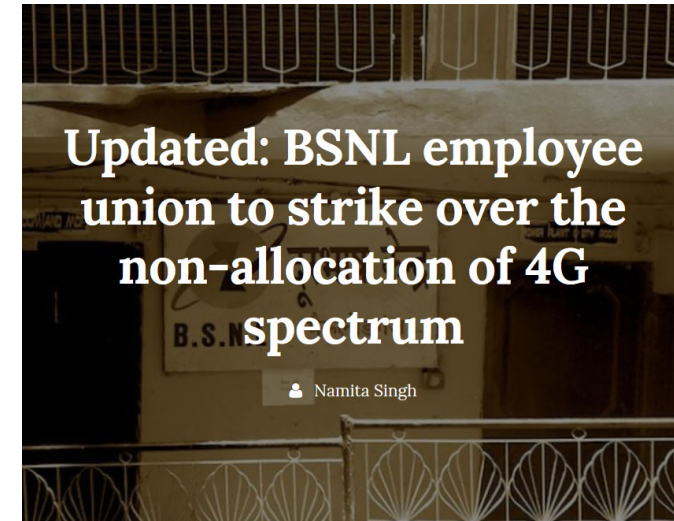
Mobile industry pre-tax operating free cash flow (EBITDA minus capex)



- Deeply flawed calculation of spectrum value.
- Failure to look at the cash flow generated by the mobile industry and the competitive situation
- Refusal to listen to the industry and expert evidence
- Compounded by other regulatory obstacles:
 - Inappropriate high annual fees linked to spectrum and turnover
 - Prohibitive taxes on sharing and trading spectrum



- In 2019 TRAI published new recommendations for reserve prices to auction the 700MHz spectrum, spectrum in 3GHz and a few other bands.
- TRAI persists to use the methodology to calculate the value of spectrum which was proven to be flawed as well as flawed international price benchmarking.
- Reserve prices for the 700MHz spectrum have been reduced by 26%
 - In 2016 the prices were too high by a factor of 10
 - Since 2016 mobile industry revenue and profitability collapsed, there are bankruptcies and balance sheets are debt laden
- Overall, the new reserve prices recommended by TRAI are again too high by a factor of 10 or more





Bangladesh: Failed spectrum auction in 2018 compounds previous policy failures



Spectrum for auction and reserve price:

- 36 MHz of 1800MHz, US\$ 540 million
- 50 MHz of 2100MHz, US\$ 675 million
- 6.8 MHz of 900MHz, US\$ 102 million
- BTRC expected to receive US\$ 1,317 million from operators.

66% of the spectrum remained unsold

- Total auction receipt amounted to only US\$ 464 million, i.e. 65% below the BTRC's target.
 - Grameenphone bought 10MHz of 1800MHz spectrum and Banglalink 11.2MHz
 - Robi (Axiata) bought 10MHz of 2100MHz spectrum.
 - The state owned operator TeleTalk did not even show up for the auction.

1. Revenue	2. Value
3. Efficient use	4. Good service
5. Competition	6. Coverage
7. Economic benefit	8. Investment



Due to the high reserve prices there was no business case to buy more spectrum



No business case

- The total reserve price of US\$1,317 million amounted to almost 3.5 times the annual cash flow generated by all mobile operators.
- On top of it there are hefty annual fees as well as the additional network investment to be made which means that operators might not receive payback on their investment for 6 years or more.

The regulator, BTRC scored a financial own goal

- Had the reserve price been set 60% lower it is highly likely that all of the spectrum would have been sold.
- BTRC would have generated up-front licence fees of US\$ 572 million, i.e. 14% more than they actually did.
- With all of 92.8MHz of spectrum on offer sold instead of only 31.2MHz, the annual spectrum fees earned by BTRC would have been almost 3 times higher.



- Deeply flawed calculation of spectrum value.
- Failure to look at the cash flow generated by the mobile industry and the competitive situation
- Refusal to listen to the industry and expert evidence
- Compounded by other regulatory obstacles:
 - The Bangladeshi mobile industry is one over the most highly taxed sectors in the world; over 50% of cash receipts are paid out in fees and taxes



Bangladesh is one of the last – if not the last – country to benefit from 4G, behind Afghanistan

- Prior to the auction, mobile operators were not allowed to refarm spectrum to 4G. This restrictive policy was driven by the desire to extract the maximum revenue from auctioning additional spectrum.
- BTRC only allowed the deployment of 4G in existing and new spectrum following the conclusion of the spectrum auction in February 2018.

The delay in introducing 4G cost Bangladesh an estimated US\$ 2.99 bn foregone GDP growth

- Refarming 1800MHz spectrum from GSM to 4G in 2015 would have generated an incremental annual growth of GDP of 0.36%.
- Over the 4-year period 2015 to 2018 this amounts to US\$ 2.99 bn.
- This is GDP forgone due to not making spectrum licences technology neutral.
- Set against this, the auction receipts of US\$ 464 million are relatively small.



Policy reappraisal appears to be under way

- Bangladeshi Telecoms and IT minister Mustafa Jabbar is prepared to consider the overall economic benefit instead of short term licence fee revenue
- Under its new Chairman Jahurul Haque, BTRC (the telecoms regulator in Bangladesh) has an opportunity to rectify what went wrong and also ensure that the 700MHz is assigned





Avoiding spectrum auction failure

Adopting policy measures and setting reserve prices to enable the roll-out of 5G

Policy makers in all countries are keen to develop mobile broadband and 5G



There is an international race to become a leader in 5G; policy makers have launched initiatives towards that goal.

- *“5G will enable industrial transformation through wireless broadband services provided at Gigabit speeds”* European Commission

In emerging markets a link is made between 5G and national development goals:

- *“We have missed three industrial revolutions, Bangladesh should be established as a leading country in the fourth industrial revolution. The whole world will enter into the era of 5G in 2020. The country will not be allowed to stay behind from this.”* (Bangladeshi Telecoms and IT minister Mustafa Jabbar, Speech at Junior Chamber International, 19 May 2018)

The policy objectives sound wonderful, but reality may get in way



- **Politics:** There is a gap between the political rhetoric and telecoms regulatory action to achieve mobile broadband and 5G policy objectives.
 - **Markets:** Since the early 2018, mobile operators and vendors started to sound more cautious about the business case for 5G.
- ▼
- Without a change in government policy with regards to spectrum availability, spectrum pricing and easing network deployment, mobile operators will not be in a position to deliver the lofty announcements made by politicians.

Operators continue to invest in 4G mobile broadband:

- Some markets are past the 4G investment peak but in many emerging markets 4G deployment capex is still increasing.
- In some markets operators have pulled back investment due to a cashflow squeeze caused by high spectrum fees.

Investment in 5G is already under way:

- Operators started to deploy Massive MIMO in combination with three-carrier aggregation thus delivering Gbit/s speeds
- Most 4G RAN investment currently taking place is software upgradable to 5G.
- Small cell deployment has started.





Return on investment must exceed the cost of capital

$$\text{Return on Investment} = \frac{\text{Profit}}{\text{Capital Employed}}$$

$$\text{Cost of Capital} = \text{What other investment opportunities do I have?}$$

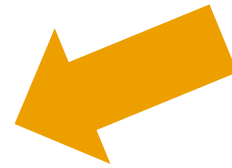


The return on investment in mobile has declined

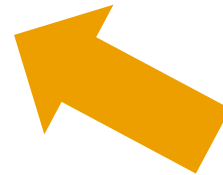
**Return on
Investment**

=

$$\frac{\text{Profit}}{\text{Capital Employed}}$$



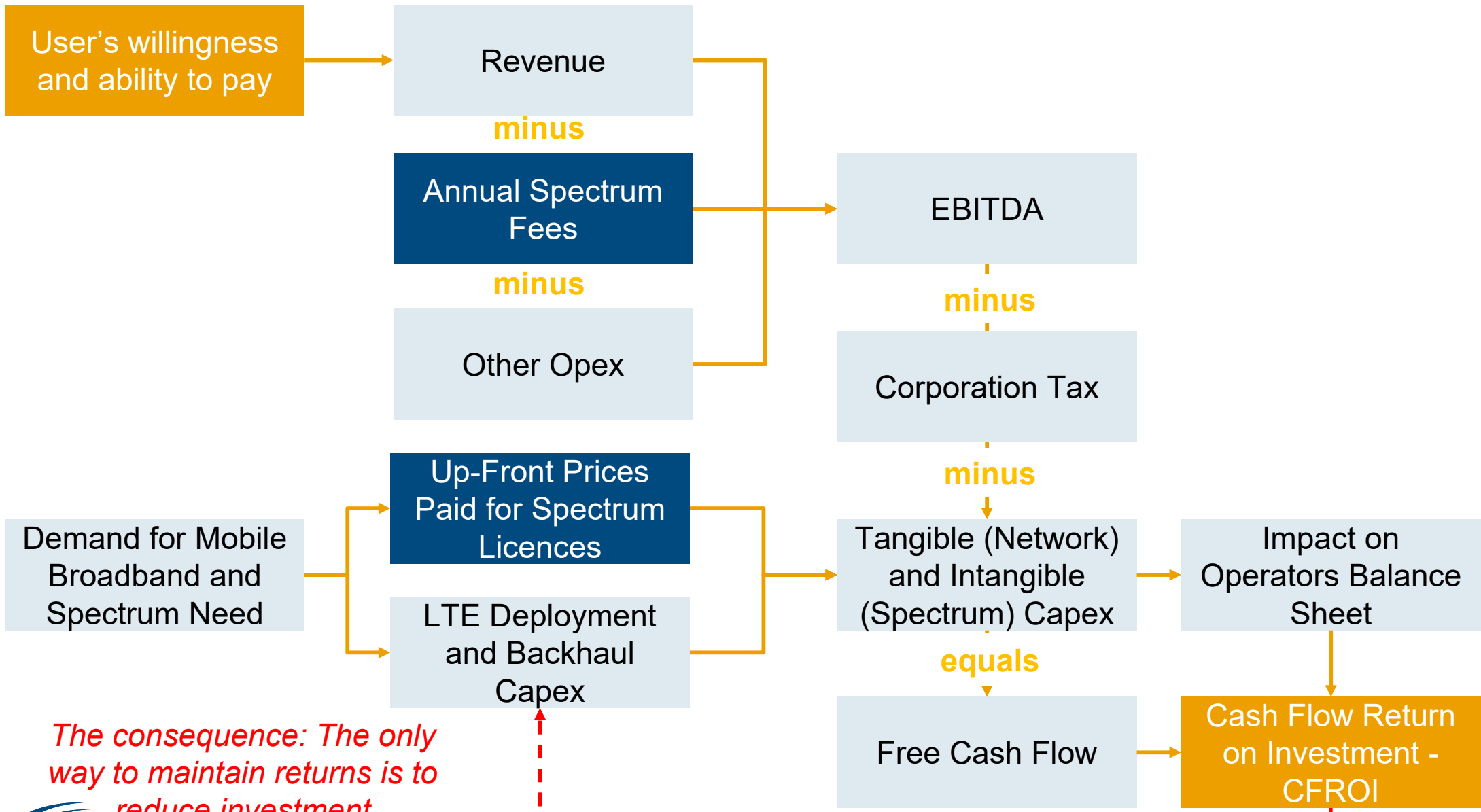
**Mobile operator profit
margins have declined in
virtually all markets**



**Network investment and
spectrum investment is
increasing**



Pricing spectrum must take account of the economics of the mobile industry; the starting point is how much users will pay



The consequence: The only way to maintain returns is to reduce investment



Spectrum pricing is only one ingredient, licence obligations and terms play a major role in determining 4G and 5G investment

- Optimising coverage and quality obligations, licence duration, and other terms to achieve your policy objectives is a difficult task given the limited 5G revenue upside outside key urban areas.

Review licence terms and conditions as to whether they encourage 4G and 5G investment!

Spectrum Licence Checklist

- ✓ Is RAN and spectrum sharing allowed to reduce costs and / or jointly deliver a coverage obligation?
- ✓ Is the spectrum licence duration 20 or 25 years as advocated by the European Commission?
- ✓ Are there unfeasible, band specific, rural coverage obligations?
- ✓ Are spectrum licences technology neutral?
- ✓ Are there other terms which unnecessarily push up operator costs?

An early comprehensive review of all leavers will help you to avoid roadblocks in your digital development strategy

- The digital development of nations requires a far-sighted outlook.
- Spectrum strategy and network investment is a long-term game.
- Don't wait until the next spectrum assignment is imminent; prepare the ground now.
- Coleago Consulting would be pleased to advise you.





Questions?

Stefan Zehle
CEO, Coleago Consulting Ltd
+44 7974 356 258
stefan.zehle@coleago.com

www.coleago.com