

RADIO COMPONENTS

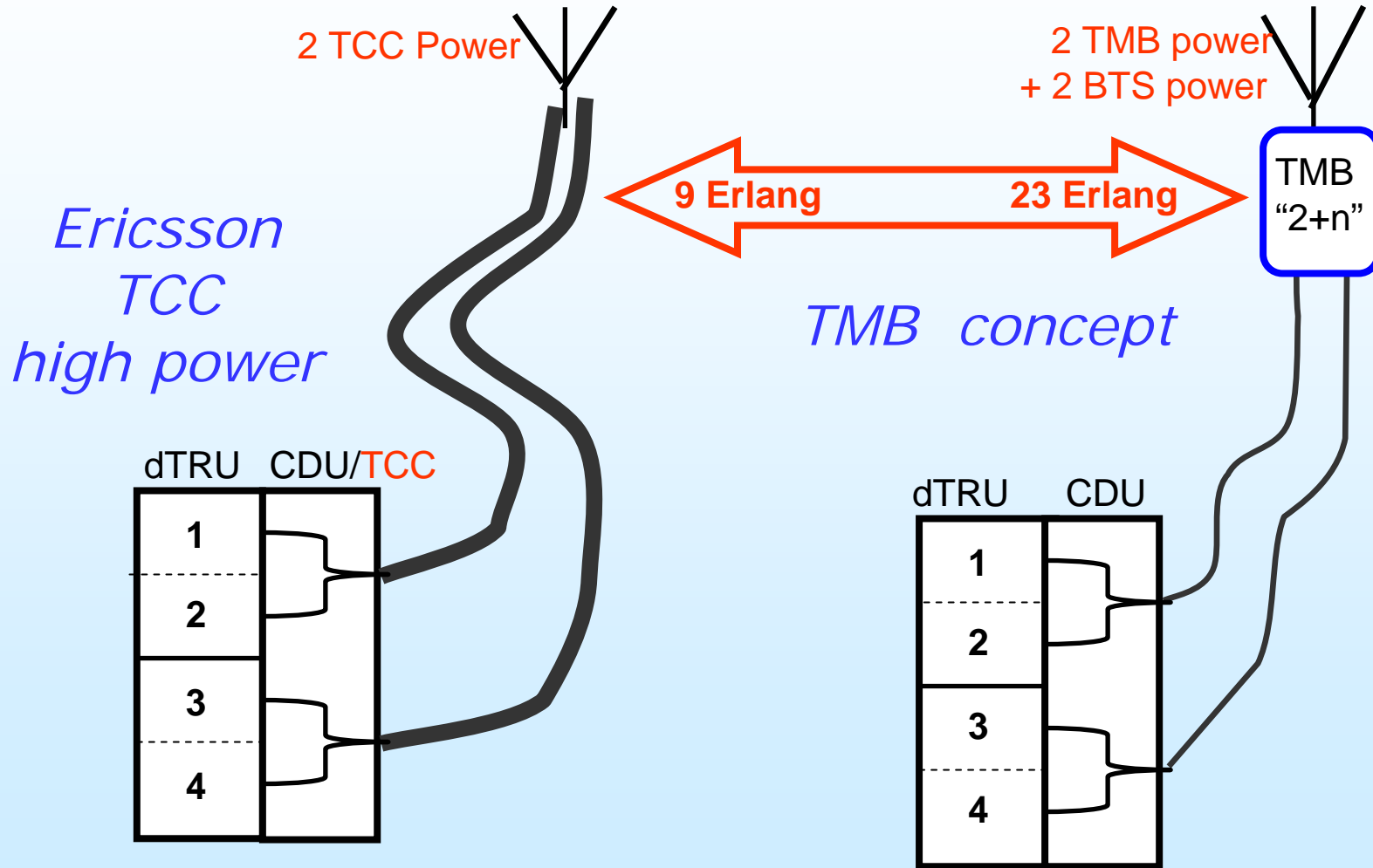


Smart Network Solutions



for the business minded
GSM1800/1900/EDGE
Operator

Single BTS cabinet – Superiour TMB capacity



Turbo EDGE

Useful Power into Antenna

Ericsson RBS2206 EDGE

- Roof top, city : 3 dB feeder/connector loss = **7 W** (38,2 dBm)
- Tower, 60m : 5 dB feeder/connector loss = **4 W** (36,2 dBm)

1)

TurboEDGE :

- Exceptional **32 W** (45 dBm)

2)

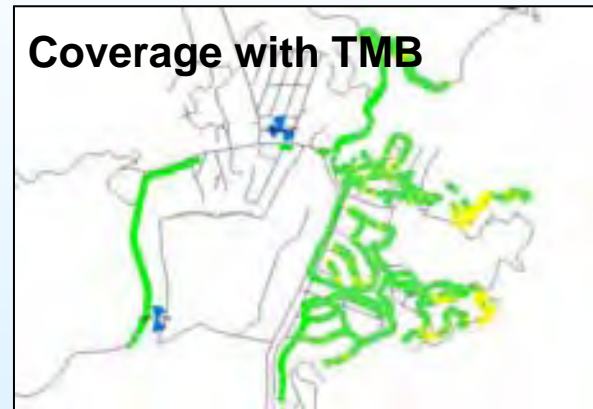
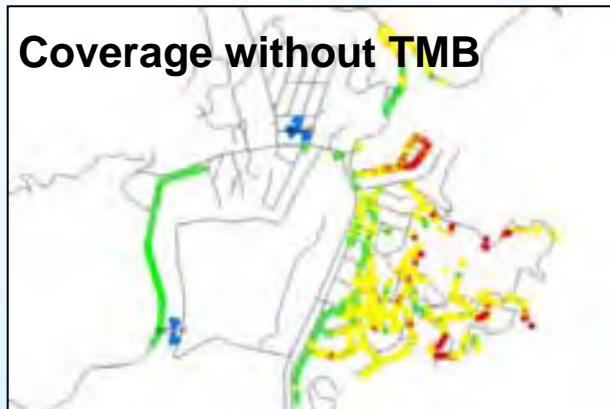
A 6 dB improvement roughly doubles the data rate

1) Ericsson RBS2206 44,5 dBm – 3,3 dB EDGE = 41,2 dBm = 13W_{average} from cabinet

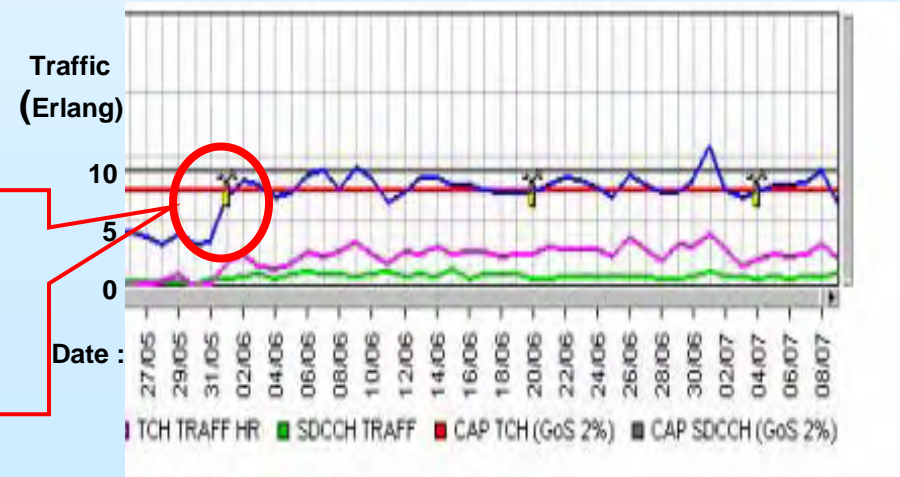
2) When reducing the BTS output power to level "P2" (4 dB lower than max) its EDGE and GSM output powers are equal and amplified by the TMB to reach 32W into the antenna for both GSM and EDGE

Traffic doubles with TMB

Operator "A" trial in Brazil with 2 channel sector upgraded with TMB 1+1



2 x traffic at TMB
installation date
31 May 2006



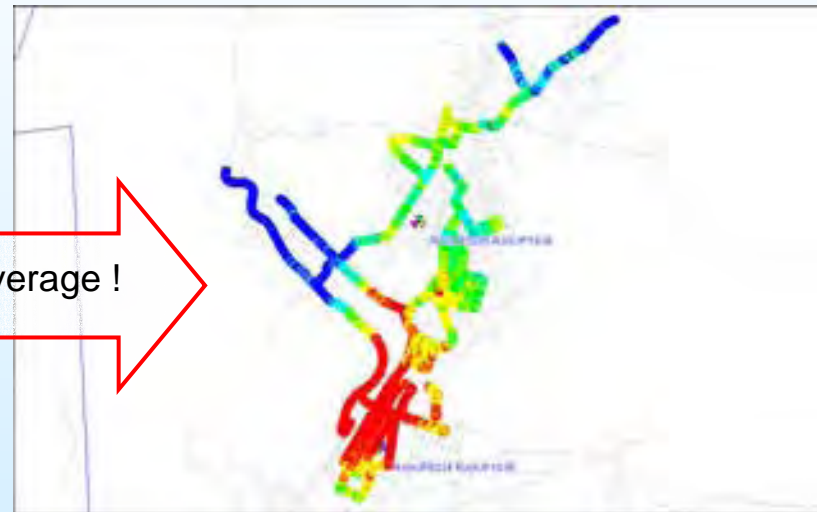
GSM1800+TMB = GSM900 coverage

Operator "B" trial in Brazil with Dual Band GSM 900/1800 sector

GSM 900 coverage



GSM1800+TMB coverage (= GSM900!)



Same coverage !

Conclusion : A GSM1800/1900 **TMB** site can replace or add capacity to a CDMA/TDMA/GSM 850 sector

TMB Applications - Overview

City Roof Top (focus TMB 2+n and TMB 2+2)

- Existing sites that can handle more traffic
 - Get more traffic from indoor mobiles
 - Get a larger 1800 cell in a 900 cell sector for useful capacity balance
- New city roll-out
 - Get GSM900 coverage with TMB1800 for min. investment & min. sites
- **Rural and villages** (focus TMB 1+1 and TMB 2+2)
 - Use high towers for best coverage without losing antenna RF power
 - Minimize feeder size (1/2" for min. wind load & space) and antennas
 - Cover a village (indoor coverage) with a site outside the village
- **General**
 - Get the extra TurboEDGE feature for faster EDGE data rate

The Company in Brief

Radio Components Sweden AB is located in the Wireless Valley of Kista/Stockholm, a world center in Cellular Systems and Mobile Multimedia development.

Founded in 1999, the company has a solid background and track record in RBS and antenna systems.

The company develops solutions to drastically cut operators' roll-out costs yet improving capacity and coverage performance. Focus is on city roof top and tower top systems. The solutions works transparently with all available base stations.



Sweden's fastest growing Hi-Tech Companies 2006

Sweden's new high tech companies show record growth in 2006.

Radio Components moves from a strong 7th position in 2005 to an impressive 4th!!

Företag	Ort	2006 miljone kronor	2005 miljone kronor	2006 ändring med 2005	2006 ändring med 2005	Verksamhet
1. Transmode	Stockholm	378	223	105	0	Optiska system
2. Packetfront 1	Stockholm	375	280	175	16	Internetföretag
3. Anoto	Lund	109	-4	99	-1	Digital penna
4. Radio Components	Stockholm	101	41	11	1	Effektiva antenner
5. Allex	Stockholm	92	42	67	22	Miljöteknik
6. Sense Air	Hudiksvall	88	46	52	10	Gasdetektor
7. Wireless Malmgate	Karlskrona	75	15	40	4	Marknadskommunikation
8. Tobii Technology 2	Stockholm	70	32	50	32	Ögöstyrt datorer
9. Baysearch Laboratories	Stockholm	69	-1	29	1	Stålbehandling
10. Accra Teknik	Piteå	65	9	35	4	Autofärdad plåt
11. Switchcore	Lund	59	-49	58	7	Svårta värdetjänster
12. Ageratec	Norrköping	59	49	32	24	positivt
13. Aerocrine	Stockholm	58	33	43	10	-8,6
14. Cellavision	Lund	55	16	37	5	negativt
15. J Nira	Stockholm	38	14	21	-7	Blodgruppsmärkare
16. Proximion Fiber Systems	Stockholm	27	17	60	17	Öldagensenkjäre
17. Neoventa Medical	Göteborg	25	0	19	0	Optisk nätövervakning
18. Appear Networks Systems	Stockholm	22	1	35	18	-35
19. Boxen Internet Software	Linköping	20	6	24	8	-21
20. Cobolt	Stockholm	19	14	20	4	Förtätningsövervakning

Note: A red circle highlights the Radio Components row, and a starburst graphic is placed over the 2006 change column for this row.

Radio Components ökar

4 Antennspecialisten Radio Components i Kista ökade från 60 till 100 miljoner i omsättning förra året. Tillväxten blir lika snabb i år, enligt företagets vd Ulf Thole.

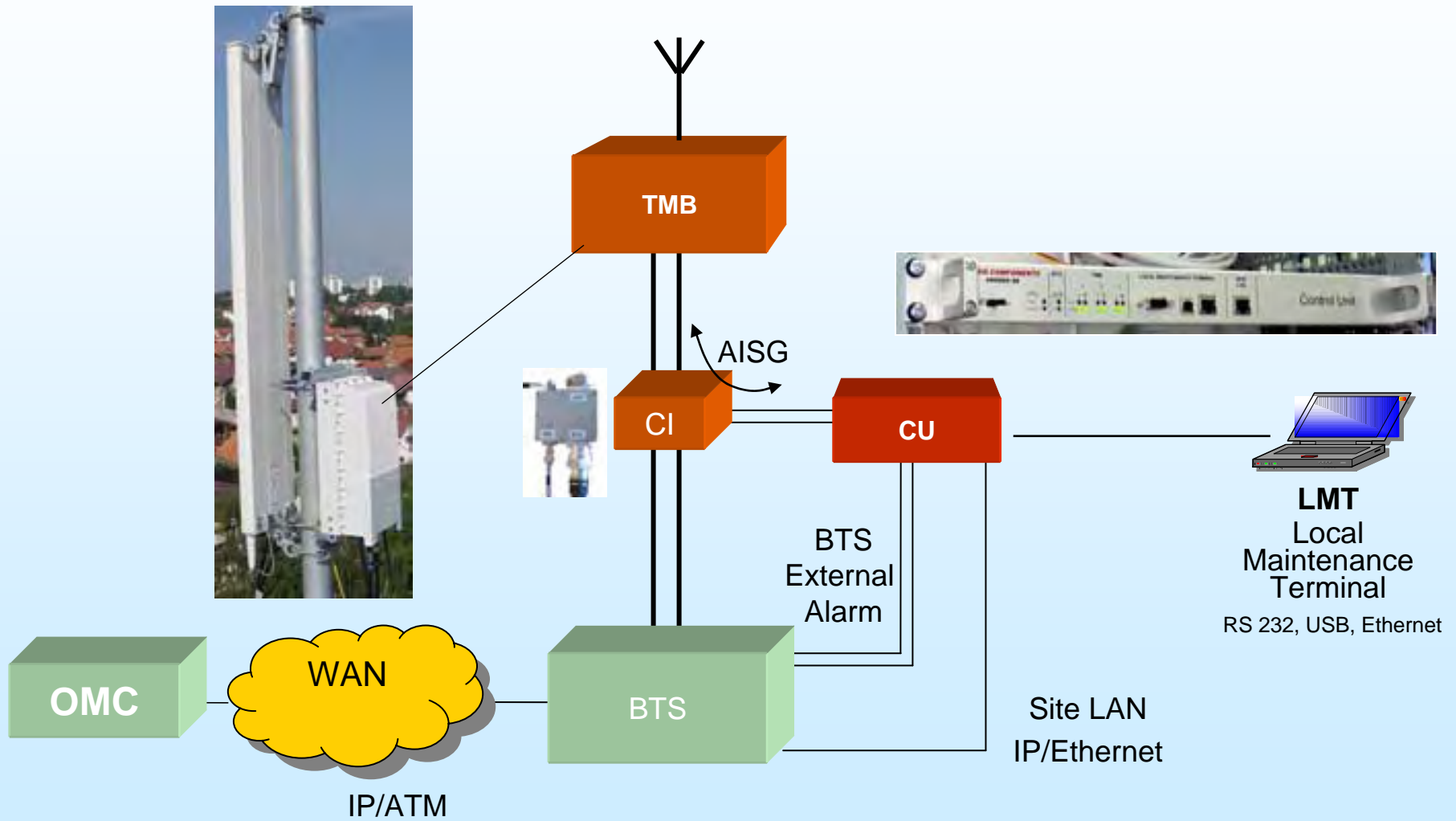
-Förutom i Ryssland och övriga Östeuropa växer vi i Latinamerika. Nästa steg blir Asien, där det sker en snabb utbyggnad av mobilnätet.

Radio Components utvecklar och säljer en "booster", som förstärker signalen både från och till en basstationsantenn. Då behov

Ulf Thole

Source: Ny Teknik, April 2007

Site configuration



GSM1800/1900 TMB performance & reliability

World's best performance

- Radio coverage (building penetration & area coverage)
 - Best UL sensitivity, NF = 1,2 dB typically
 - Balanced DL for best coverage + min. interference
- TurboEDGE for world's fastest DL data rate
- Most TRX /sector & single BTS cabinet (best capacity)

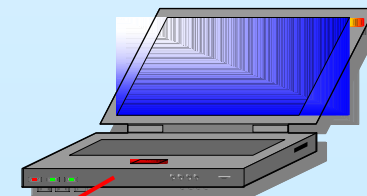
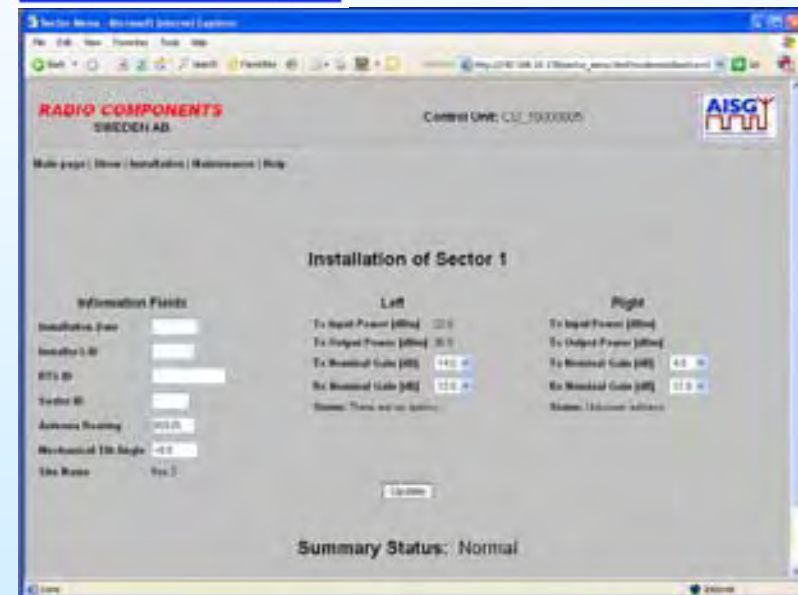
Reliability

- More than 6000 sectors in service
- Verified / certified for
 - IP67 for rain storms (water tight)
 - Tower vibrations
 - -45/+55 °C ambient temperature
 - Tested for -50 °C cold start
- Automatic protection for excessive input power & temp's
- No moving mechanical parts (no fans or relays)
- Very low power consumption for
 - low inside temperature = long life
 - better battery backup time

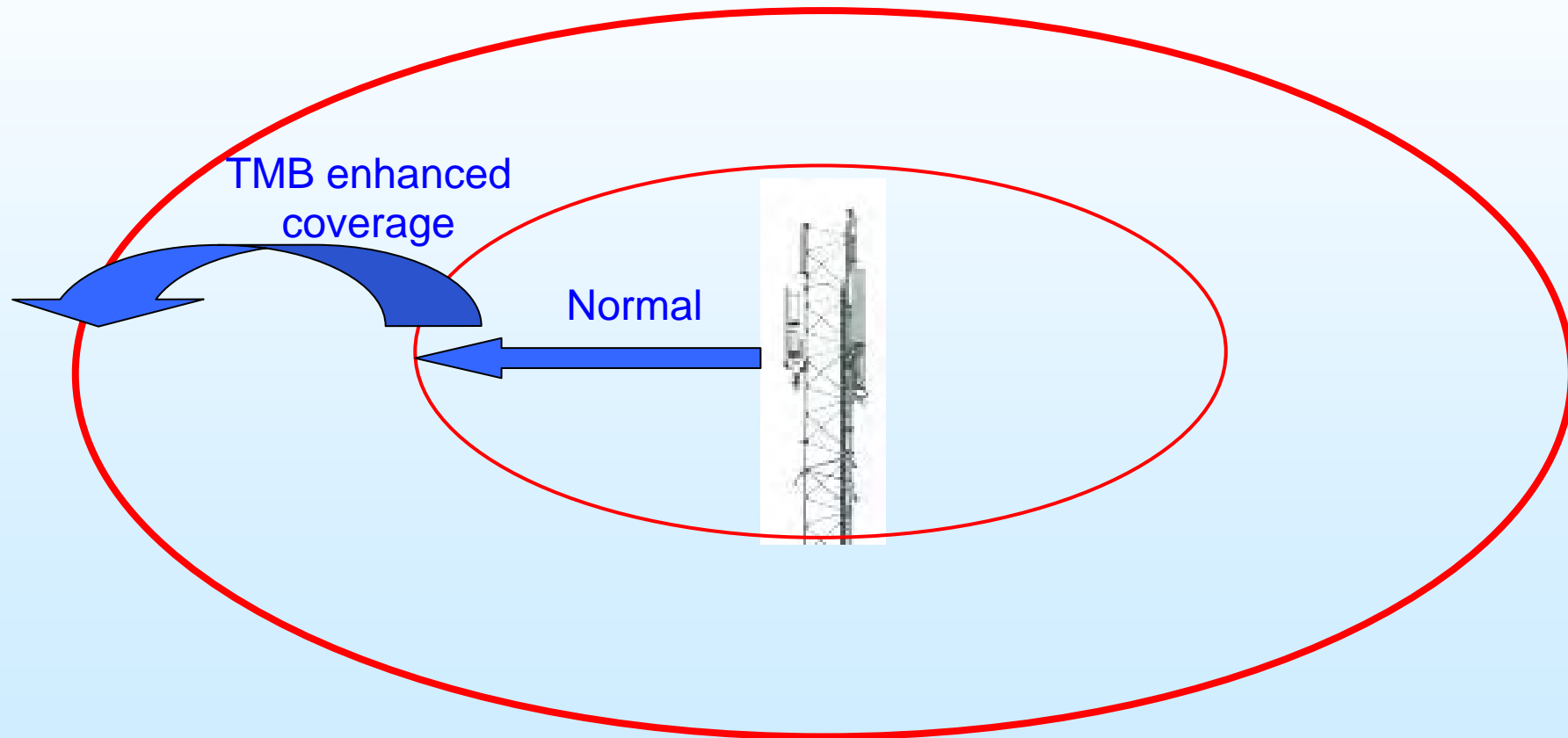


Supervision & Control

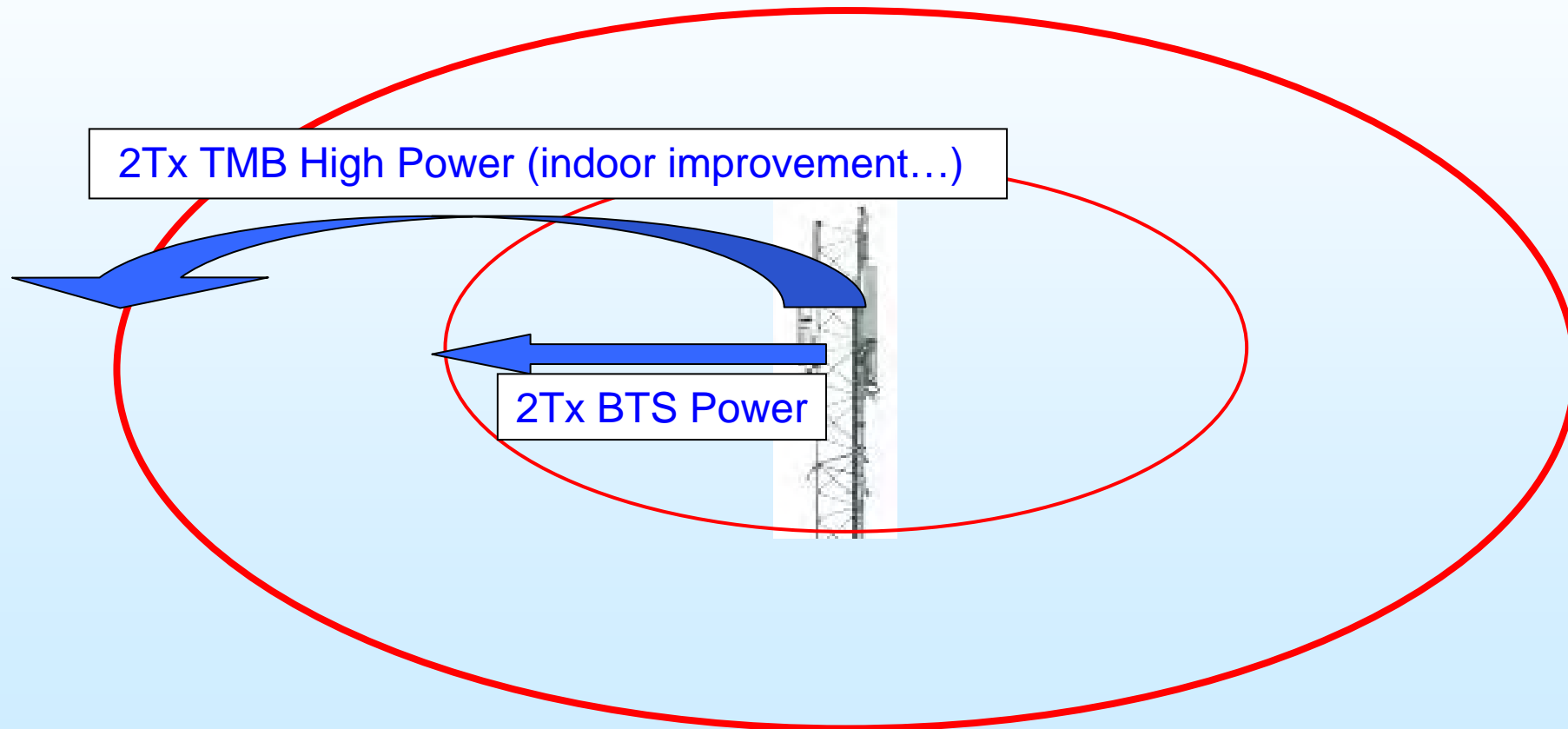
- *Operation & Maintenance*
- Full software control & supervision
- User friendly WEB interface (see picture)
- Remote management (Ethernet or GPRS modem)
- Local connection by standard laptop (no special SW needed)
- Alarms by BTS “external alarm” (critical & non-critical)
- Automatic reallocation of BCCH (if one channel faulty)
- Software upgrading remotely
- AISG standard feeder signalling (no interference)



Rural tower site – Low capacity TMB1+1 (2 TX)



Capacity & Coverage : TMB 2 + n (4Tx)



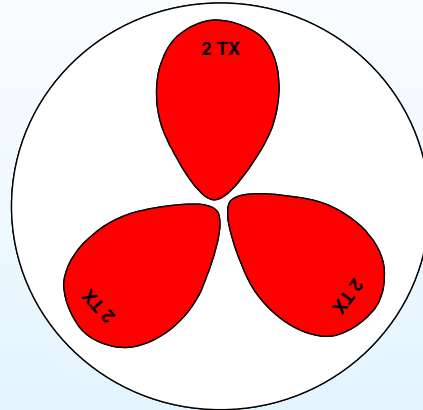
TMB configurations – Capacity & Coverage

TMB 1+1 System / 9 – 37 Erlang/sector

BTS Single Cabinet

Coverage
Rural/City start-up

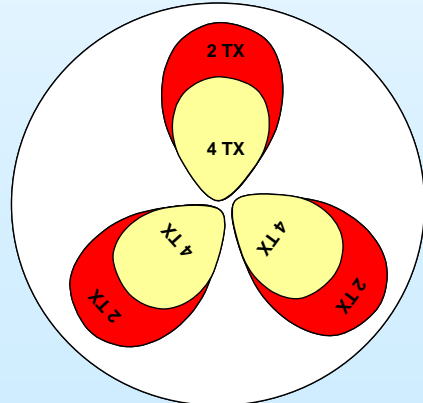
Capacity
2/2/2 (9 E/sector)



BTS Dual Cabinet

Coverage
City
TMB indoor coverage

Capacity
6/6/6 (37 E/sector)

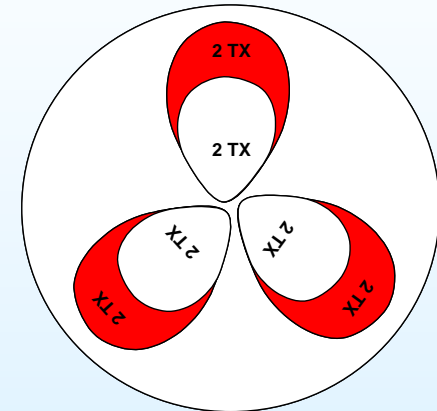


TMB 2+n System / 23 - 52 Erlang/sector

BTS Single Cabinet

Coverage
Rural/City

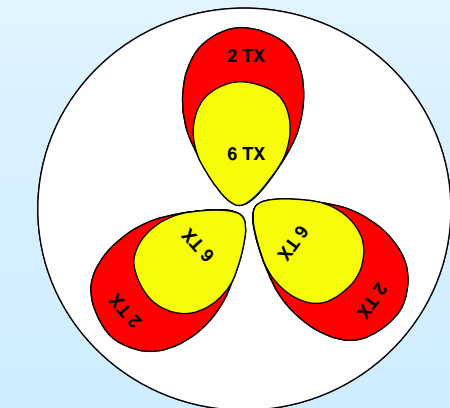
Capacity
4/4/4 (23 E/sector)



BTS Dual Cabinet

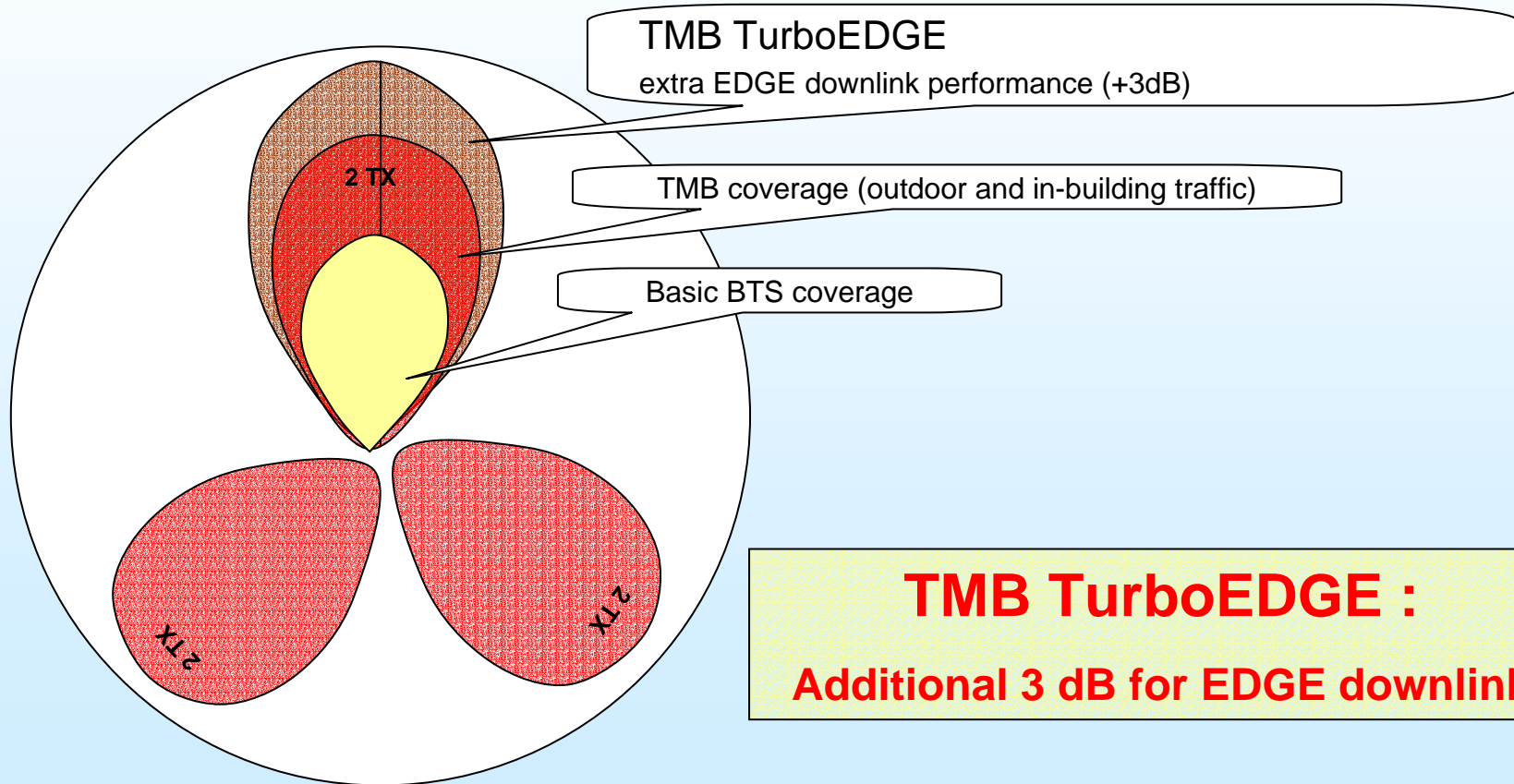
Coverage
City
TMB indoor coverage

Capacity
8/8/8 (52 E/sector)

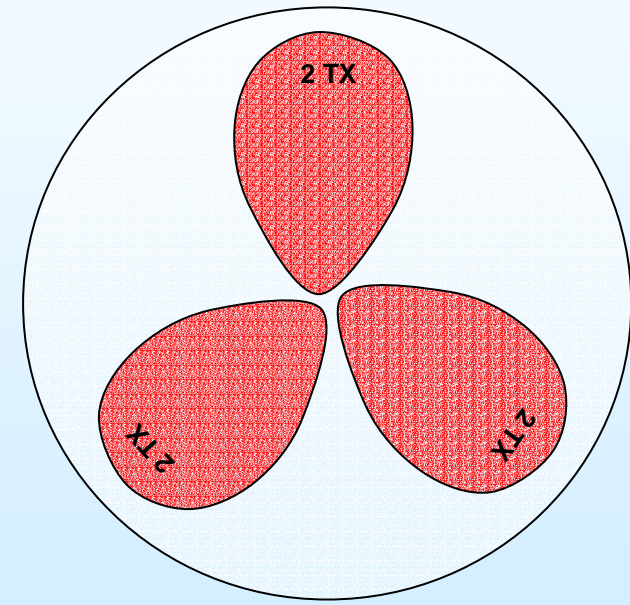
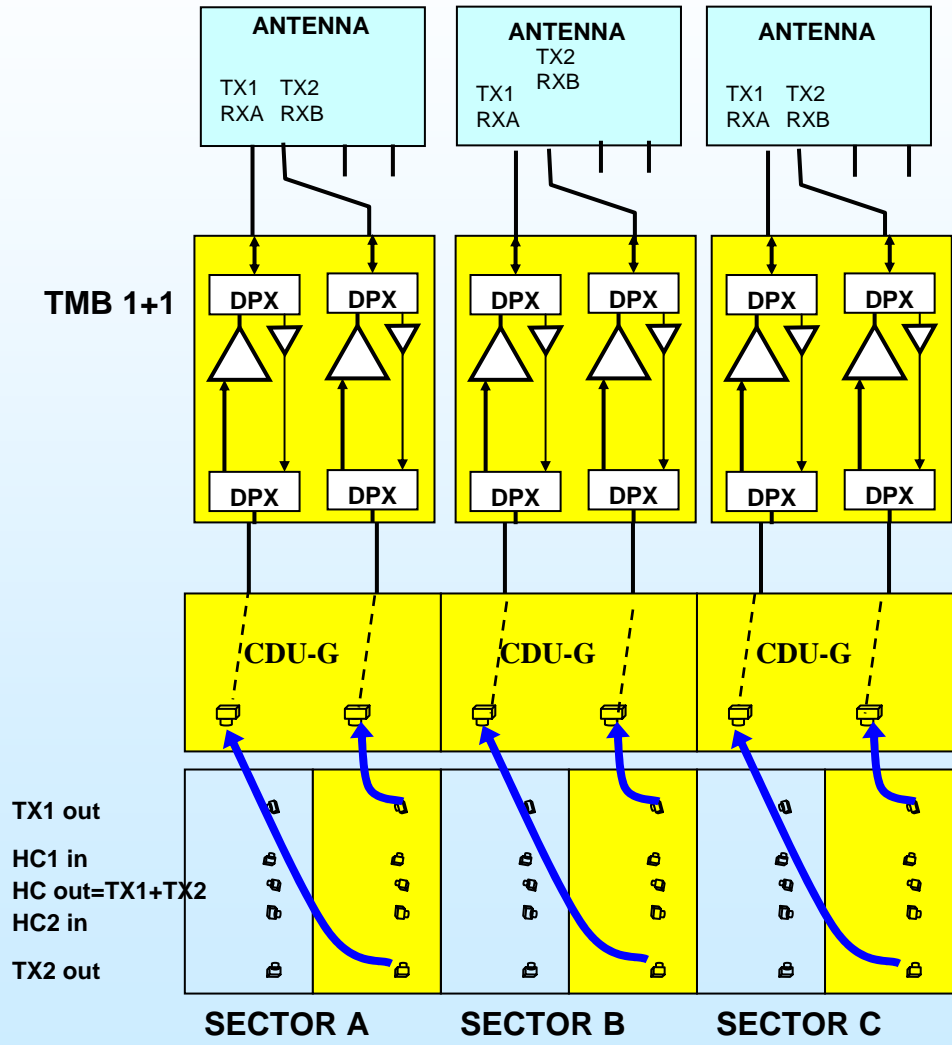


Notes : The small cell size vs TMB cell : **67% range & 45% area**

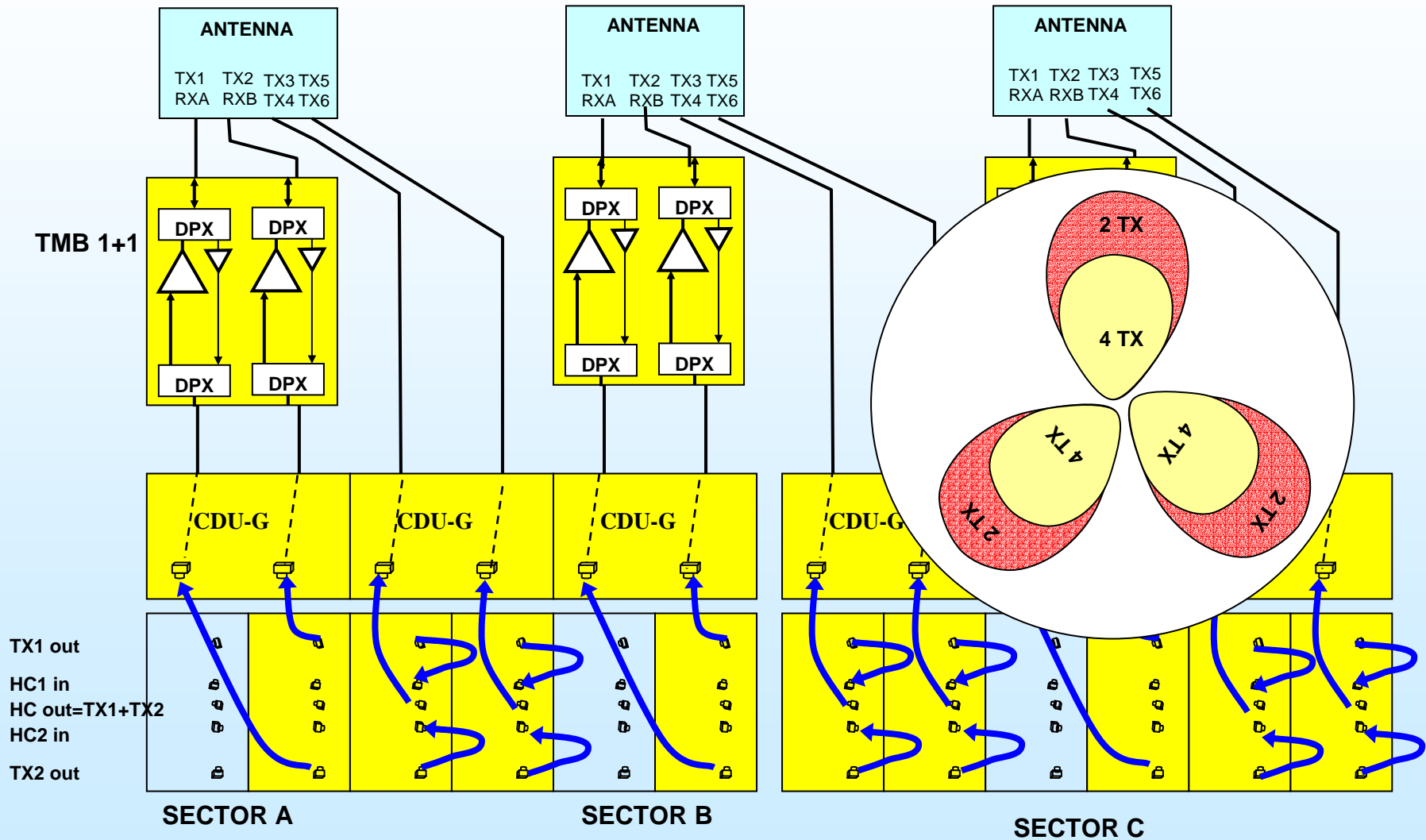
TMB configurations – Capacity upgrading



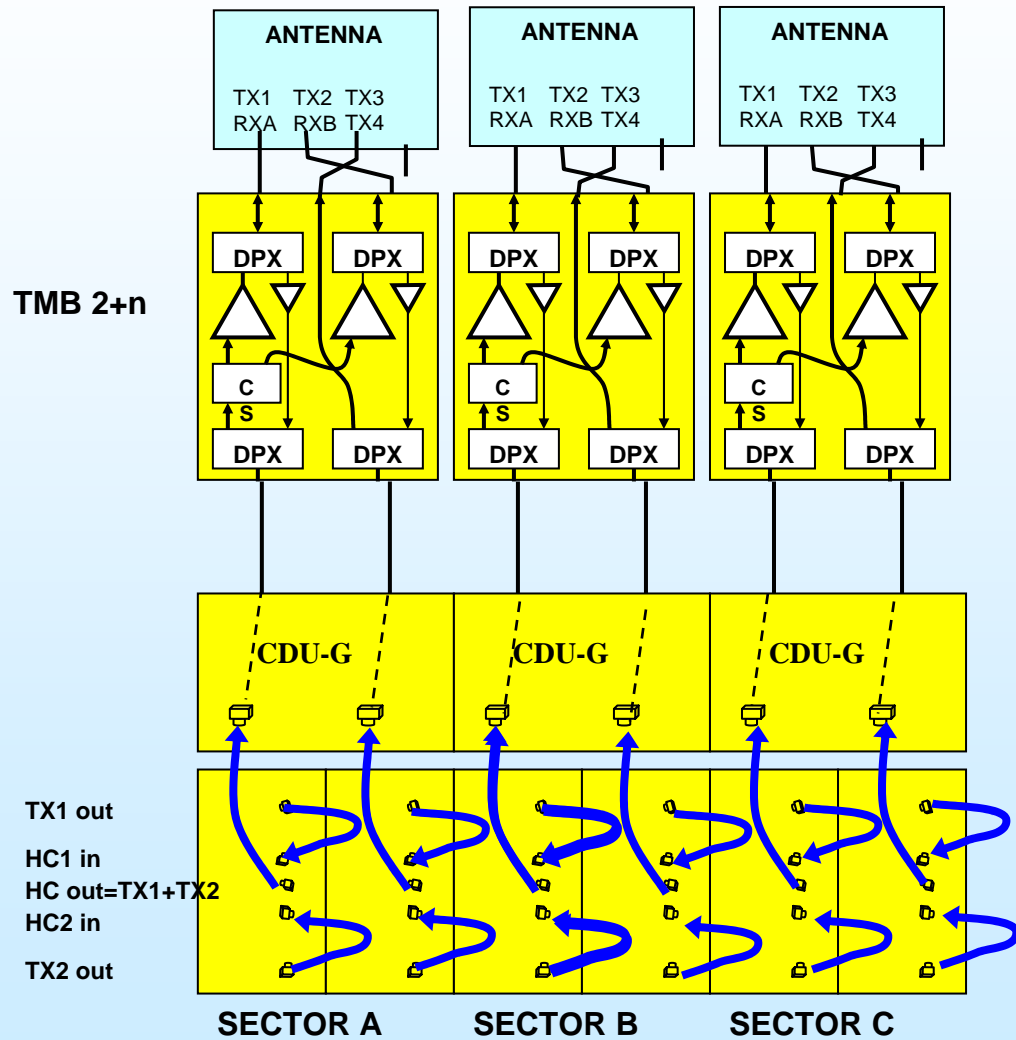
TMB 1+1 : BTS Single Cabinet – 2/2/2 capacity sector



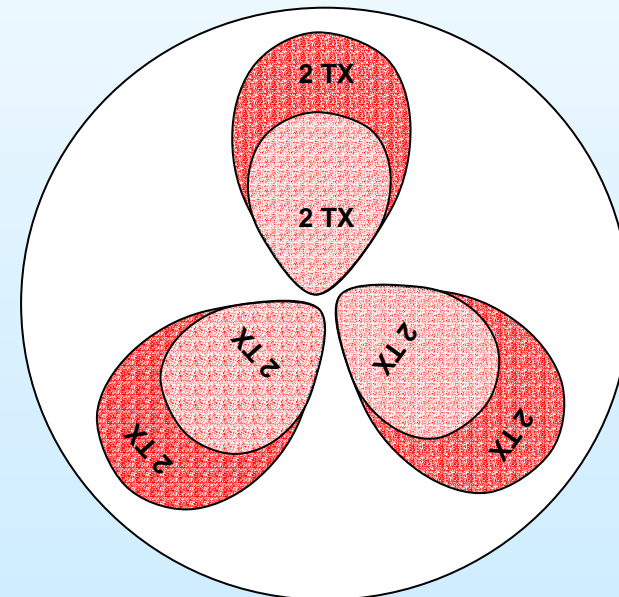
TMB 1+1 : BTS Dual Cabinet – 6/6/6 capacity sector



TMB 2+n : BTS Single Cabinet – 4/4/4 capacity sector



Typical coverage and capacity improvement, traffic balance through overlay/underlay config.



TMB 2+n : BTS Dual Cabinet – 8/8/8 capacity sector

