Infrastructure Inputs Monitoring Project

DBSA Knowledge Week – Greening Infrastructure

13 October 2011

Agenda

- Background & TOR
- Methodology
- Overall issues
- Demand side key issues
  - Buildings
  - Housing
  - Roads
  - Water
  - Telecommunications
  - Energy
  - Transport
- Private sector infrastructure/capital demand
- Supply side key issues
- Greening issues

IIMP - Terms of reference

- Consolidation of the previous public sector source data (2007 & 2008) into a single updatable database and research manual sufficiently detailed to facilitate analysis
- Captures both large private and public projects
- Undertake selected interviews to strengthen data and identify key issues related to government strategic outcomes, localisation, procurement and integrated infrastructure planning.
- Make data available in electronic format only (e.g. via web site). This system will be developed by the consultant in partnership with the DBSA and maintained by the DBSA.

Methodology

- Approach changed from tracking conditional grants to tracking actual National, Provincial and Municipal budgets and expenditure reports
- Heavy dependence on National Treasury budgeting and accounting systems
  - Publically available expenditure data – based on regular annual MTEF publications, Annual Reports, Annual Strategic Plans, Budget Vote documents & presentations, presentations to Parliament's portfolio committees
  - As far as possible, define expenditure spatially – province & municipal level
  - In absence of published info, extrapolate existing data & verify/update through direct interviews/requests for unpublished data

Public sector infrastructure types

	Estimated 2010/11 expenditure Rm	Estimated 2011/12 expenditure Rm	Estimated 2012/13 expenditure Rm	Estimated 2013/14 expenditure Rm
Buildings & construction	43 306	47 287	70 539	82 027
Housing	12 898	14 941	15 599	16 457
Roads	45 971	43 250	43 292	38 476
Water & sanitation	17 375	29 330	28 420	20 648
Telecommunications	2 702	2 324	1 690	1 927
Electricity & energy	124 611	137 238	141 546	144 449
Transport	28 799	23 923	22 796	25 891
Total	275 663	298 293	323 881	329 875

Key conclusions

- Considerable latent demand but blockages in executing infrastructure projects, particularly at provincial and municipal sphere, for which considerably supply capacity exists
- Significant weight of labour-intensive Building & Construction in both public and private infrastructure demand
- Few supply constraints currently
- Future supply constraints can be anticipated and addressed by domestic supply and/or imports
- PPI growth of most inputs have outstripped overall national PPI between 2000-2010. Input prices could become a constraint to future infrastructure plans
- Potential to apply infrastructure demand database towards more detailed spatial planning

Factors impacting on infrastructure demand

- Generic
  - Capacity (municipal/provincial) for project preparation, tendering and execution – nicely summarised in Budget Review 2011:p.57
  - Demand forecasting accuracy (munic/prov)
  - Prov/Munic Budgeted vs. actual infrastructure expenditure
- Specific infrastructure sector factors
  - Buildings
  - Roads
  - Water
  - Energy

Buildings – R47b

Rand (million)	**2010/11**	**2011/12**	**2012/13**	**2013/14**
National department - Buildings	7 033	6 989	5 840	6 296
Forensic laboratories	147	92	10	747
Prisons	950	968	1 016	1 072
Prisons - PPP	187	187	3 320	6 267
Other PPPs	250	2 402	5 758	2 800
Neighbourhood development partnership grant	1 030	750	800	800
2010 stadiums	512	0	0	0
DTI IDZs	1 224	827	839	629
Municipalities - Buildings	5 826	7 933	8 516	0
Provinces - Buildings				
Hospitals	6 674	8 114	7 951	7 542
Hospitals - PPP	96	16	4 024	8 808
Education - buildings	9 574	12 784	12 602	16 884
Other public entities not specified individually (Extra-budgetary Institutions, PPPs, non-financial public enterprises)	4 527	6 225	19 862	30 182
Total - Rand (million)	**38 030**	**47 287**	**70 539**	**82 027**

Buildings – factors impacting on demand

- Improve municipal infrastructure forecasting
- Improve building project execution capabilities at provincial and local government level
- Public private partnerships
- Accelerate housing delivery reforms (devolution to munics + private sector financing involvement)

Roads – R43b

	2010/11	2011/12	2012/13	2013/14
	R (million)	R (million)	R (million)	R (million)
Provincial roads	17 806	18 256	19 057	19 963
SANRAL (non toll)	6 845	8 757	10 531	11 273
SANRAL (toll roads)	8 387	2 593	1 984	1 487
SANRAL (PPP private component)	6 604	4 493	2 968	1 967
Municipal roads	6 329	9 151	8 752	3 785
Total	**45 971**	**43 250**	**43 292**	**38 476**

Roads – factors impacting on demand

- Provincial expenditure – budget vs. actual – diversion of equitable share
- Addressing road maintenance backlog (Provincial R42b, Metros R13b, Munics R14b)
- Toll road project timelines
- Regional road projects

Water R26b

Rand milion		2010/11	2011/12	2012/13	2013/14
	Water Affairs	1 014	2 149	2 293	2 490
extra-budg.inst	The Water Trading Entity	1 838	2 294	2 599	2 729
Munic (S.71 report)	Water Reservoirs and Reticulation	7 684	6 342	6 542	6 901
Munic (S.71 report)	Sewerage Purification and Reticulation	2 741	2 616	2 699	2 847
	PPP water and sanitation	20	0	2 133	4 267
extra-budg. Inst	Inkomati Catchment Management Agency	2	2	3	3
non-fin. PE	Trans-Caledon Tunnel Authority	5 070	8 986	4 823	4 755
non-fin. PE	Albany Coast Water Board	0	0	0	0
non-fin. PE	Amatola Water Board	82	107	177	155
non-fin. PE	Bloem Water	167	120	104	34
non-fin. PE	Botshelo Water	0	6	4	4
non-fin. PE	Bushbuckridge Water Board	10	5	5	10
non-fin. PE	Lepelle Northern Water	24	117	115	121
non-fin. PE	Magalies Water	14	110	3	4
non-fin. PE	Mhlathuze Water	174	90	24	0
non-fin. PE	Namakwa Water	4	14	24	24
non-fin. PE	Overberg Water	11	4	2	2
non-fin. PE	Rand Water	1 290	2 133	2 230	2 231
non-fin. PE	Sedibeng Water	31	65	31	26
non-fin. PE	Umgeni Water	816	712	509	497
	Total	**20 992**	**25 872**	**24 319**	**27 099**

Water – factors impacting on demand

- Accuracy of municipal-level expenditure data
- The rate at which backlogs in regional bulk water and municipal sanitation infrastructure are addressed/ Impact of water losses/leaks
- Municipal payments to Water Boards

Energy – R138b

Summary - Electricity & energy infrastructure	2010/11	2011/12	2012/13	2013/14
Eskom				
Generation	73 634	83 852	90 228	93 616
Transmission	14 541	11 877	17 706	18 315
Distribution	8 654	10 705	12 784	14 893
Corporate (incl ED)	679	372	423	317
Research & Development	3 838	4 790	3 518	3 828
PPP Generation	4 500	9 000		
Integrated national electrification programme grant	1 020	1 097	1 151	1 215
Integrated national electrification programme (Eskom) grant	1 720	1 738	1 882	1 986
Municipal reticulation	4 336	5 102	4 846	
Municipal street lighting	147	259	305	
CEF - Greenfield crude oil refinery	6 800	4 278	8 207	10 148
Transnet fuel pipeline (NMPP)	5 421	4 541	918	449
Total	125 290	137 610	141 969	144 766

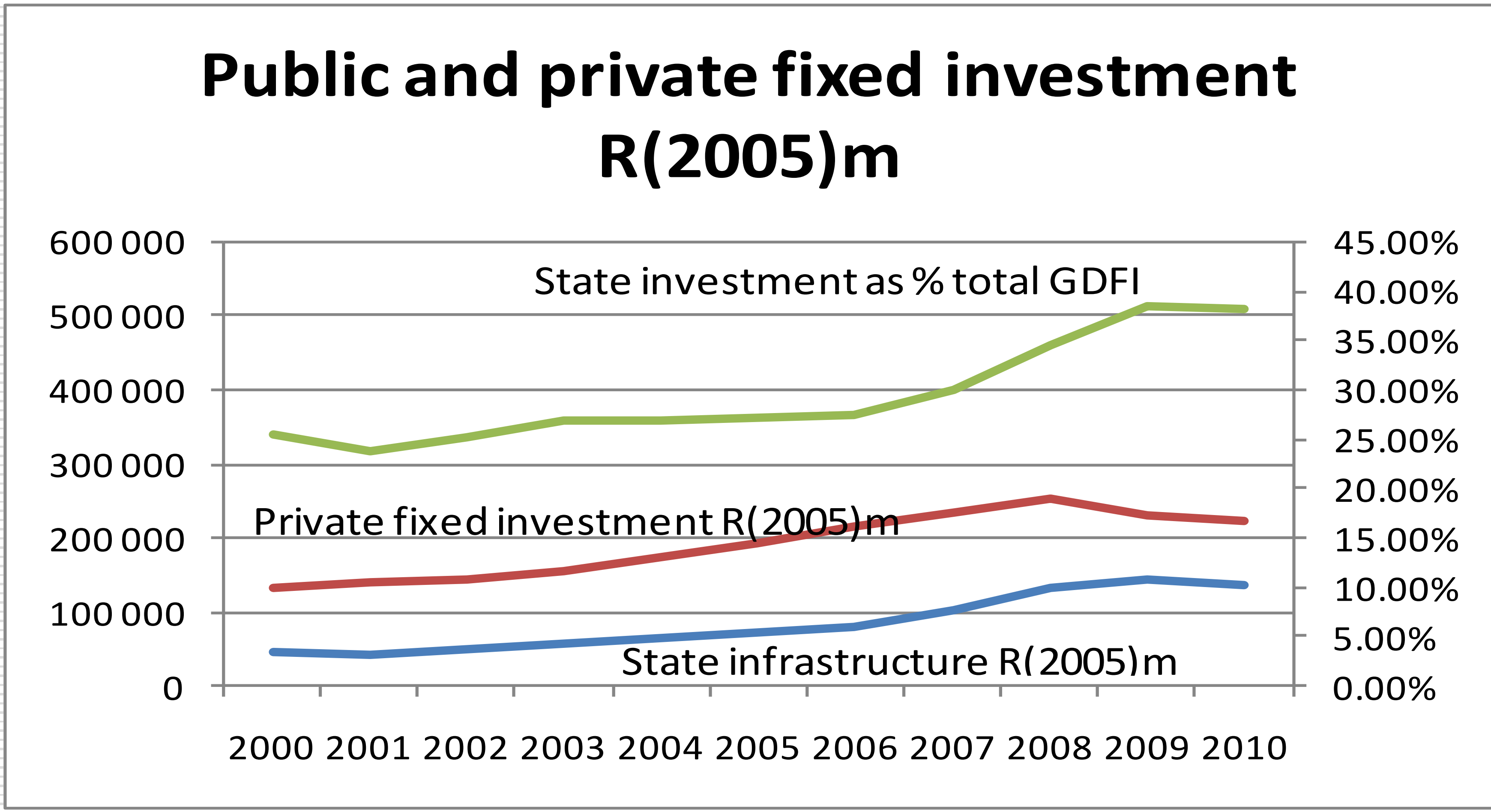
Energy – factors impacting on demand

- Data sourced directly from SOEs/Nersa – difficult to verify
- Energy Regulation changes impacting on IPP, renewables, solar geysers
- Electricity distribution industry investment - R27b backlog
- NIRP 2 generation technology options/associated LTMS issues
- Liquid fuels sector investments driven by decision on clean fuel specifications

Key Conclusions - Private sector infrastructure demand

- Strong component of building & construction (including by services sector)
- Private GDFI spend is twice that of public sector with commensurate impact on infrastructure input supply industries
- Unblocking impediments to private investment equally important

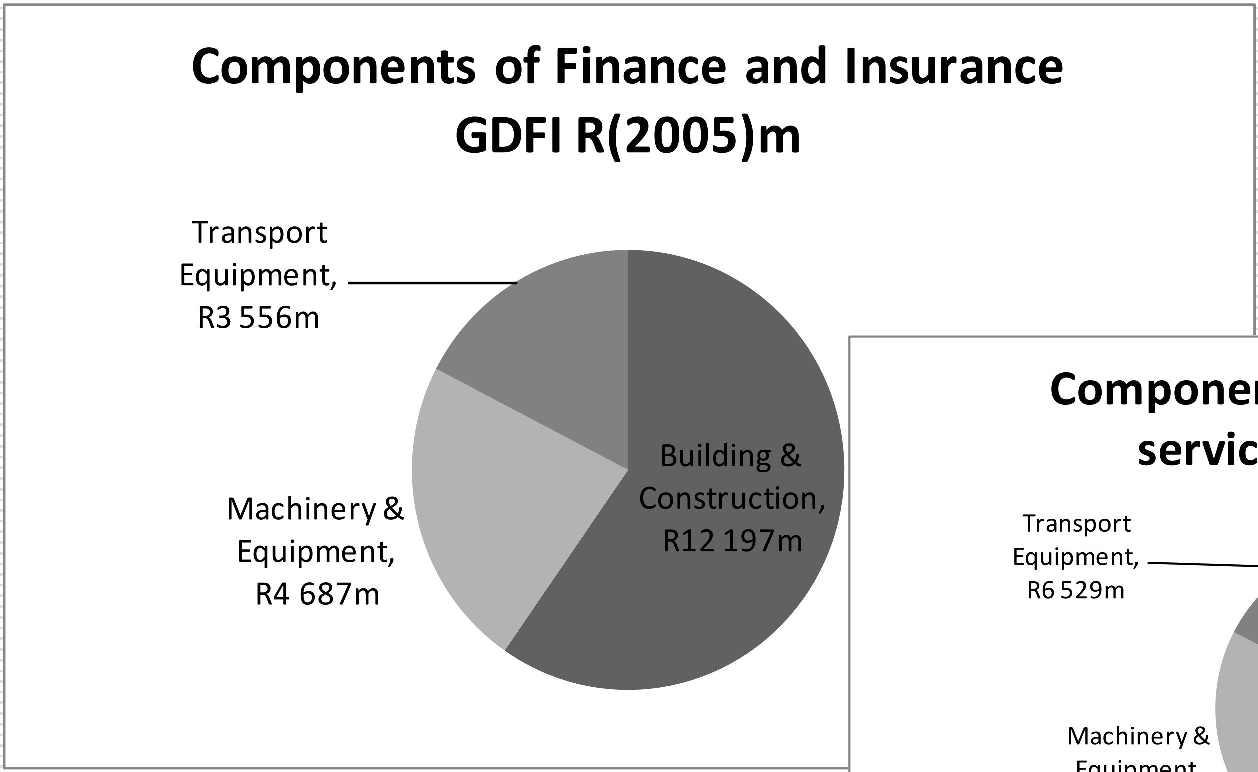
Private vs Public GDFI

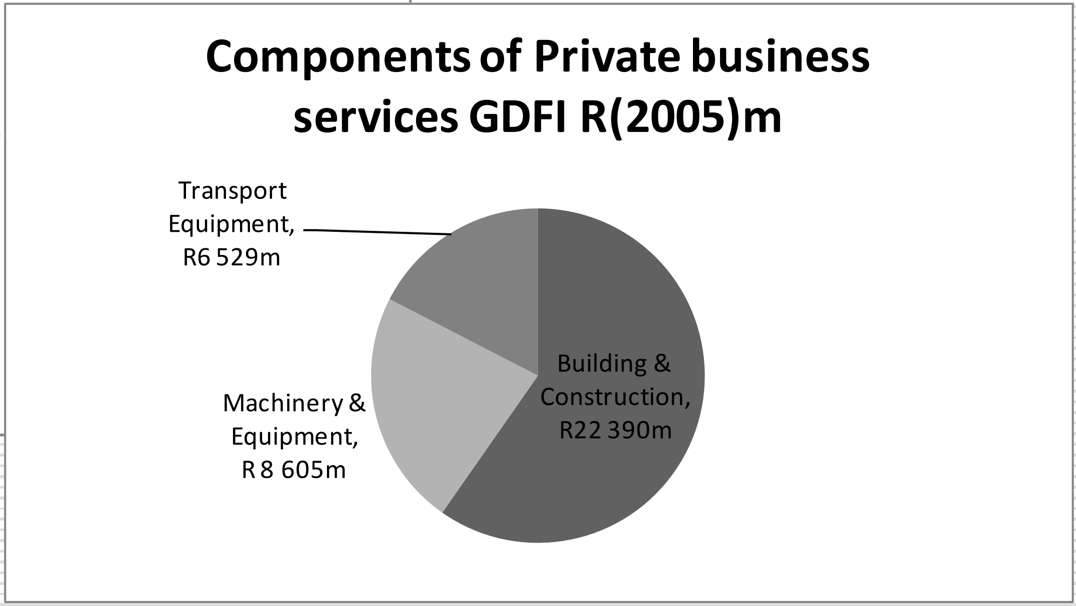


Components of private "infrastructure" expenditure

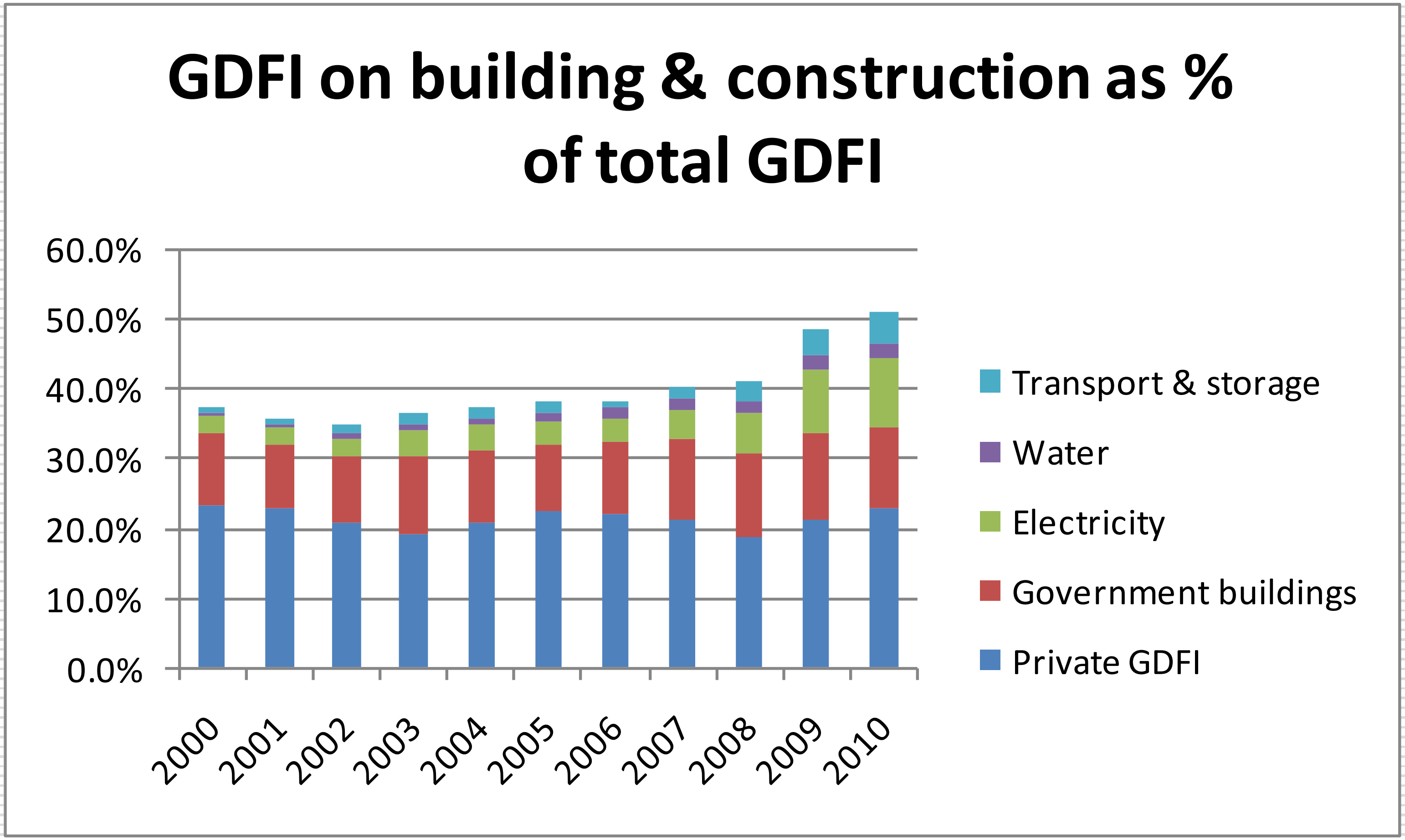
Private infrastructure investment - 2010 R(2005)m	Total	Building & construction	Machinery & equipment	Transport equipment
Gold & Uranium mining	11 111	6 890	3 854	367
Coal mining	10 060	5 508	4 160	392
Other mining	21 397	11 318	8 439	1 640
Coke & refined petroleum products	9 651	985	8 633	34
Basic chemicals	5 640	162	5 443	35
Other chemicals & man-made fibres	2 714	655	2 038	20
Basic iron & steel	2 168	521	1 634	13
Finance & insurance	20 441	12 197	4 687	3 556
Business services	37 523	22 390	8 605	6 529
Transport & storage	44 253	16 016	9 917	18 320
Communication	20 680	7 485	4 634	8 561
Wholesale & retail trade	22 249	4 733	11 784	5 732
Total Private infrastructure-related fixed investment	207 888	88 860	73 829	45 199
Total Public sector infrastructure	148 273	104 798	19 714	23 761

How many "infrastructure" rands related to private services capex





Importance of "Building & Construction" – 50% of GDFI



Supply side sectors

- Steel
- Aluminium
- Cement
- Concrete products
- Bricks
- Timber
- Glass
- Plastic pipes
- Aggregates and Sand
- Bitumen
- Capital equipment
- Skills
- Transport and logistics costs
- Energy requirements
- Water requirements

Steel

- Dominance of one supplier - Periodic shortage of key steel products – rebar
- Electricity price increases/Scrap metal availability
- Domestic demand recovery/growth
- Pricing & competition issues
- Capacity utilisation
- Steel pricing and competition issues (Mining roof bolts, Wire mesh)
- New investment in primary steel production

Aluminium

- Aluminium input costs
- Imports of extruded products, from China, Malaysia and Brazil.
  - In December 2010, ITAC supported the AEA's request to increase tariffs to 5% on imported extrusions
  - ITAC investigated increasing tariffs on aluminium rolled products to 10% but rejected application.
- Aluminium scrap exports – adverse impact on domestic aluminium foundry. Investigation underway
- Local billet production stopped. Planned closure of Bayside slab plant in 2012
- Competitiveness of the RSA casting industry
- Revival of aluminium casting industry, supported by the DTI's NFTN initiative

Cement

- Consensus view on demand forecasting and supply capacity
- Supply-demand balance
  - Appears finely balanced beyond 2012
  - Existing players – brownfield investments to replace old kilns, reduce costs and emissions
  - New entrants making substantial investments
- Cost pressures impeding timeous investment in increasing capacity
- Electricity, Transport and logistics costs and reliability
- Increasingly demanding Environmental legislation and management/ageing plant
- EIA and licensing (air, water, waste) process delays
- Compliance and enforcement regulations around quarrying/mining operations
- Inconsistent enforcement of mining regulations
- Competition investigation – Statistics availability

Bitumen

- Reliability of refinery supply
- Predictability in demand forecasting

Database capabilities

- Potential for spatial analysis positive but may require a specific effort as the data is migrated from excel into the DBSA database
  - National infrastructure data generally site-specific
  - Provincial data needs work to extract site-specific info
  - Individual Municipal data available for:
    - Roads, Pavements, Bridges & Storm Water Water Reservoirs & Reticulation Car Parks, Bus Terminals and Taxi Ranks Electricity Reticulation Sewerage Purification & Reticulation Housing Street Lighting Refuse sites Gas Parks & Gardens Sportsfields Community Halls Libraries Recreational Facilities Clinics Museums & Art Galleries motor vehicles Plant & equipment Office equipment Abattoirs Markets Airports Security Measures Civic Land and Buildings Other Land and Buildings Other-ass Special Vehicles (Refuse Fire Conservancy Ambulances Buses) Agricultural Assets

Some policy implications

- Disaggregation of infrastructure demand types – Implications for specific supply sectors
- Role of buildings & construction (public & private spend)
- Multiplier impact of infrastructure expenditure
- Improve capacity & ability by spending agencies to spend allocated funds
- Diversion of infrastructure funds and grants to other activities
- Public sector procurement efficiency
- Address factors impeding private sector infrastructure expenditure
- Infrastructure input pricing
- Will better supply-demand data contribute to greater confidence by suppliers of infrastructure inputs?

Greening infrastructure issues

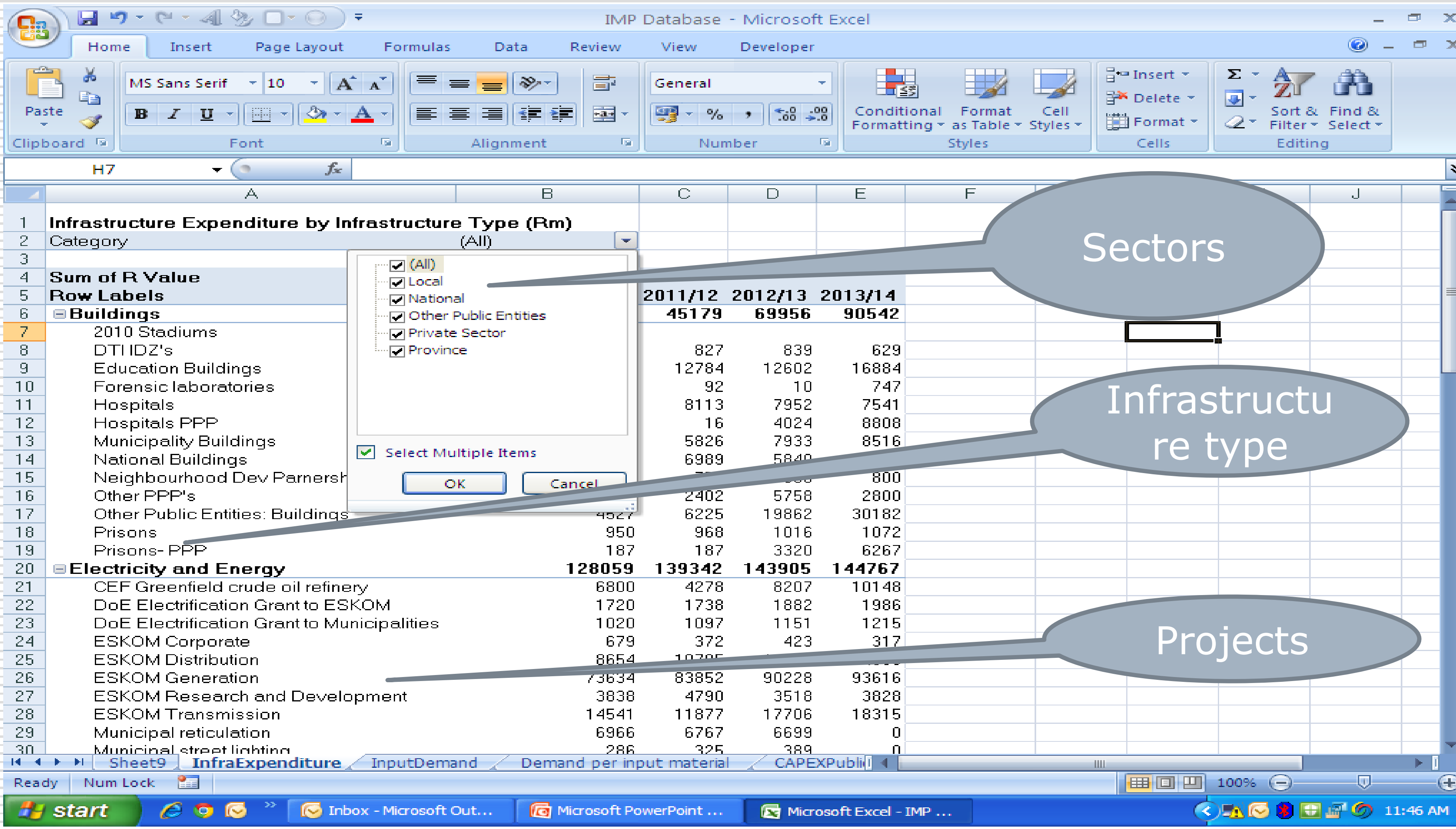
- Impact of rising energy costs on energy-intensive supply sectors (steel, aluminium, cement, glass, bricks)
- Energy efficiency & climate change
  - Nuclear vs coal
  - Renewable generation technologies
  - Tighter fuel specifications
  - Building regulations
- Environmental regulation
  - Cement & brick production technology

Database structure

- Sectors:
  - Public
  - Provincial
  - Local
  - Extra budgetary institutions
  - Private sector
- Infrastructure types
  - Buildings
  - Housing
  - Roads
  - Water
  - Telecommunications
  - Electricity & Energy
  - Transport
- Infrastructure Inputs
  - Material type e g Cement, Steel, etc
  - Skills
- Projects
  - Name
  - Spatial location
- Time dimension

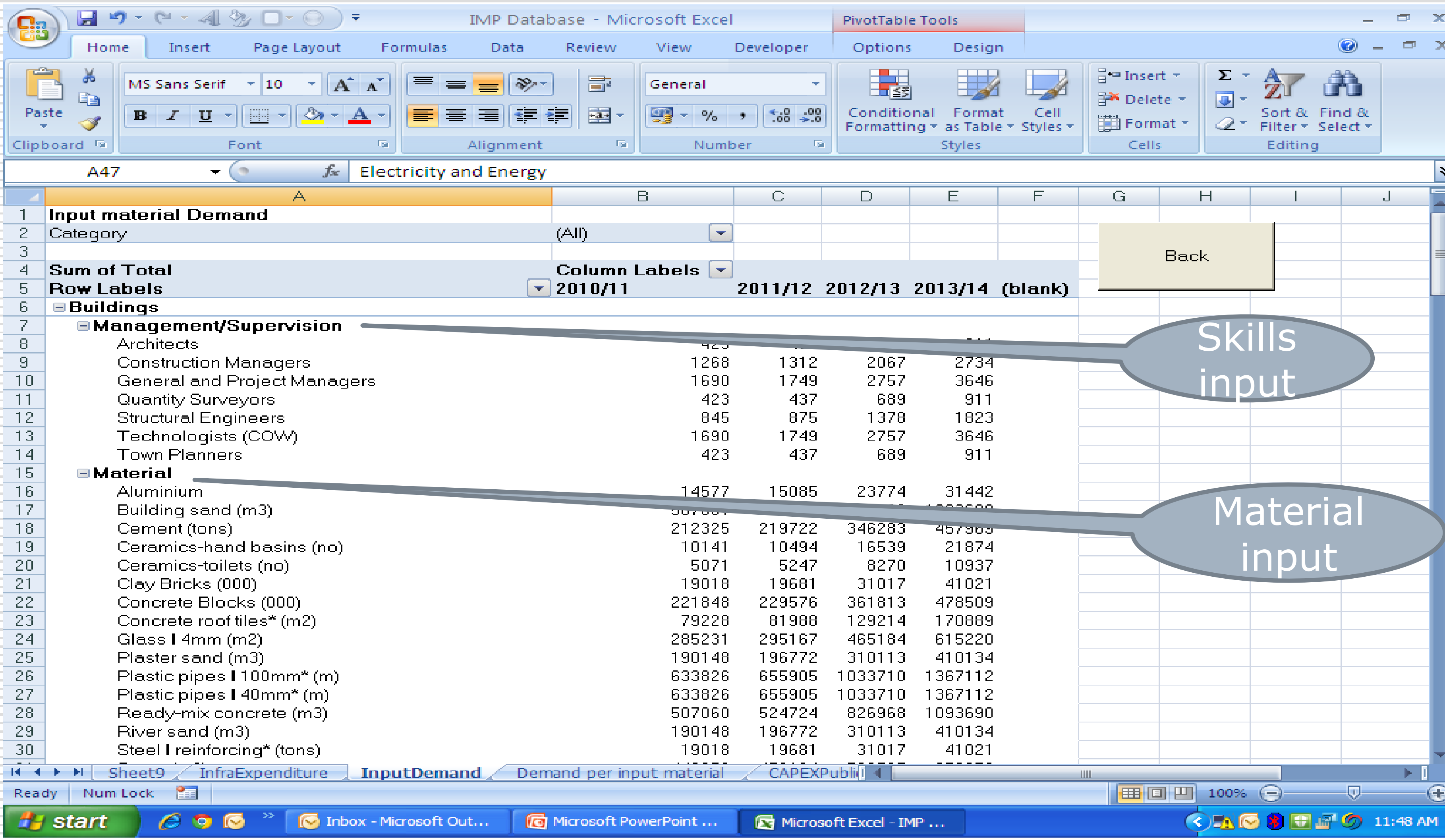
Various permutations possible

Sector/Infrastructure Type /Projects



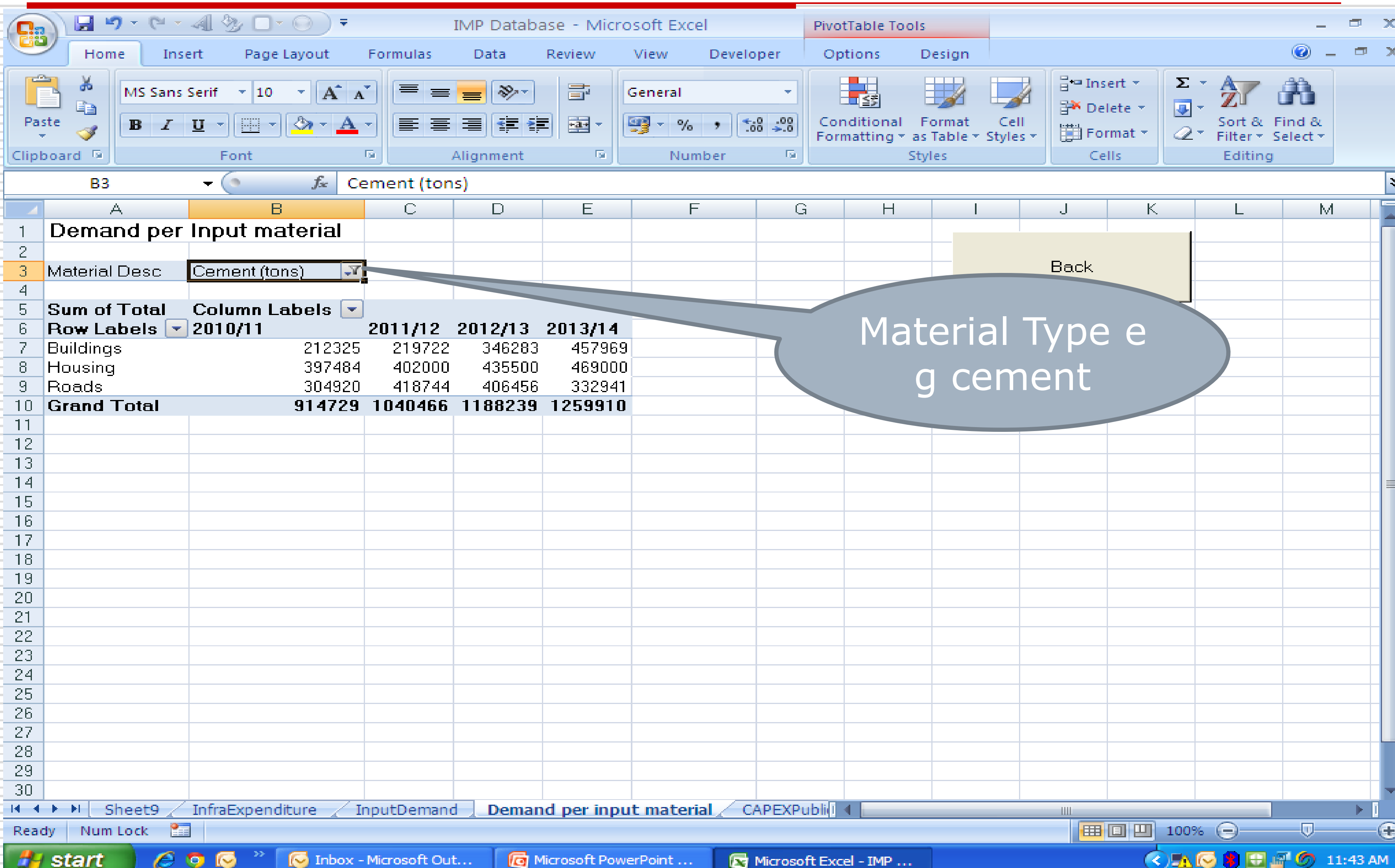
Row Labels		2011/12	2012/13	2013/14
Buildings		45179	69956	90542
2010 Stadiums				
DTI IDZ's		827	839	629
Education Buildings		12784	12602	16884
Forensic laboratories		92	10	747
Hospitals		8113	7952	7541
Hospitals PPP		16	4024	8808
Municipality Buildings		5826	7933	8516
National Buildings		6989	5840	
Neighbourhood Dev Parnersh		[illegible]	[illegible]	800
Other PPP's		2402	5758	2800
Other Public Entities: Buildings	4527	6225	19862	30182
Prisons	950	968	1016	1072
Prisons- PPP	187	187	3320	6267
Electricity and Energy	128059	139342	143905	144767
CEF Greenfield crude oil refinery	6800	4278	8207	10148
DoE Electrification Grant to ESKOM	1720	1738	1882	1986
DoE Electrification Grant to Municipalities	1020	1097	1151	1215
ESKOM Corporate	679	372	423	317
ESKOM Distribution	8654	[illegible]	[illegible]	[illegible]
ESKOM Generation	73634	83852	90228	93616
ESKOM Research and Development	3838	4790	3518	3828
ESKOM Transmission	14541	11877	17706	18315
Municipal reticulation	6966	6767	6699	0
Municipal street lighting	286	325	389	0

Sector/Infrastructure inputs



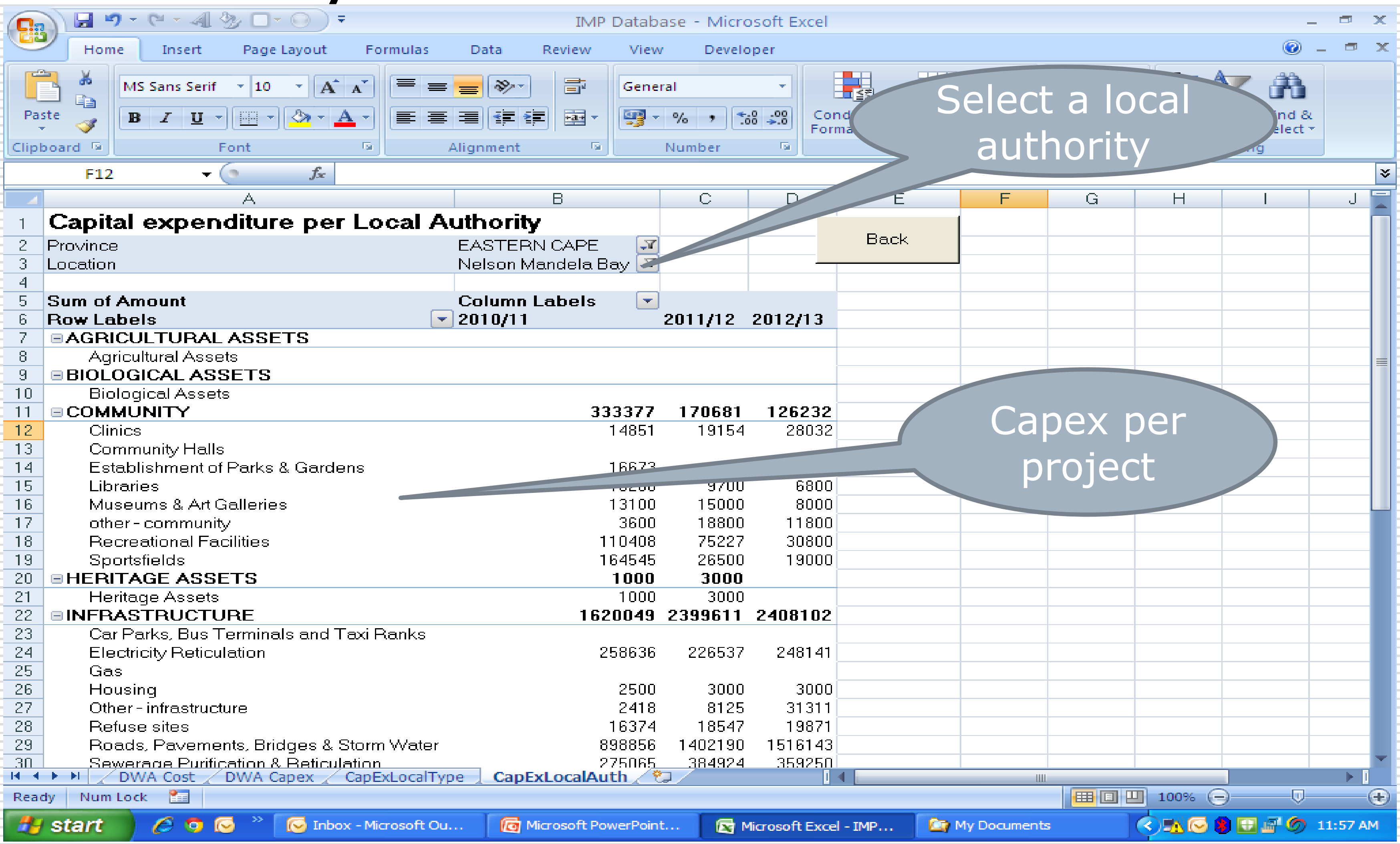
	A	B	C	D	E	F
1	**Input material Demand**					
2	Category	(All)				
3						
4	**Sum of Total**	**Column Labels**				
5	**Row Labels**	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**(blank)**
6	**Buildings**					
7	**Management/Supervision**					
8	Architects	[illegible]	[illegible]	[illegible]	[illegible]	
9	Construction Managers	1268	1312	2067	2734	
10	General and Project Managers	1690	1749	2757	3646	
11	Quantity Surveyors	423	437	689	911	
12	Structural Engineers	845	875	1378	1823	
13	Technologists (COW)	1690	1749	2757	3646	
14	Town Planners	423	437	689	911	
15	**Material**					
16	Aluminium	14577	15085	23774	31442	
17	Building sand (m3)	[illegible]	[illegible]	[illegible]	[illegible]	
18	Cement (tons)	212325	219722	346283	[illegible]	
19	Ceramics-hand basins (no)	10141	10494	16539	21874	
20	Ceramics-toilets (no)	5071	5247	8270	10937	
21	Clay Bricks (000)	19018	19681	31017	41021	
22	Concrete Blocks (000)	221848	229576	361813	478509	
23	Concrete roof tiles* (m2)	79228	81988	129214	170889	
24	Glass I 4mm (m2)	285231	295167	465184	615220	
25	Plaster sand (m3)	190148	196772	310113	410134	
26	Plastic pipes I 100mm* (m)	633826	655905	1033710	1367112	
27	Plastic pipes I 40mm* (m)	633826	655905	1033710	1367112	
28	Ready-mix concrete (m3)	507060	524724	826968	1093690	
29	River sand (m3)	190148	196772	310113	410134	
30	Steel I reinforcing* (tons)	19018	19681	31017	41021	

Infrastructure inputs specific



Sum of Total	Column Labels			
Row Labels	2010/11	2011/12	2012/13	2013/14
Buildings	212325	219722	346283	457969
Housing	397484	402000	435500	469000
Roads	304920	418744	406456	332941
Grand Total	**914729**	**1040466**	**1188239**	**1259910**

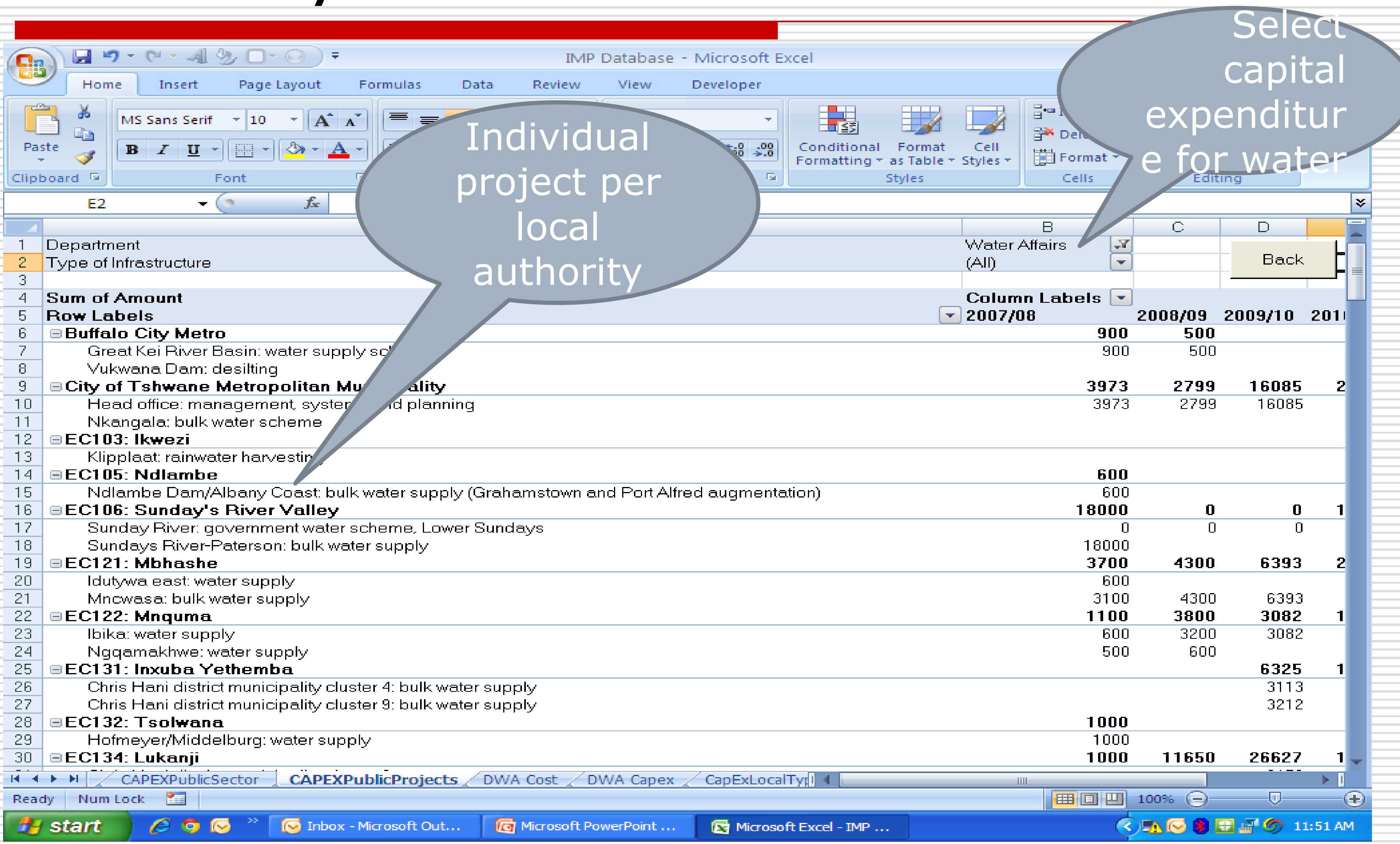
Capital expenditure per local Authority



Capital expenditure per Local Authority

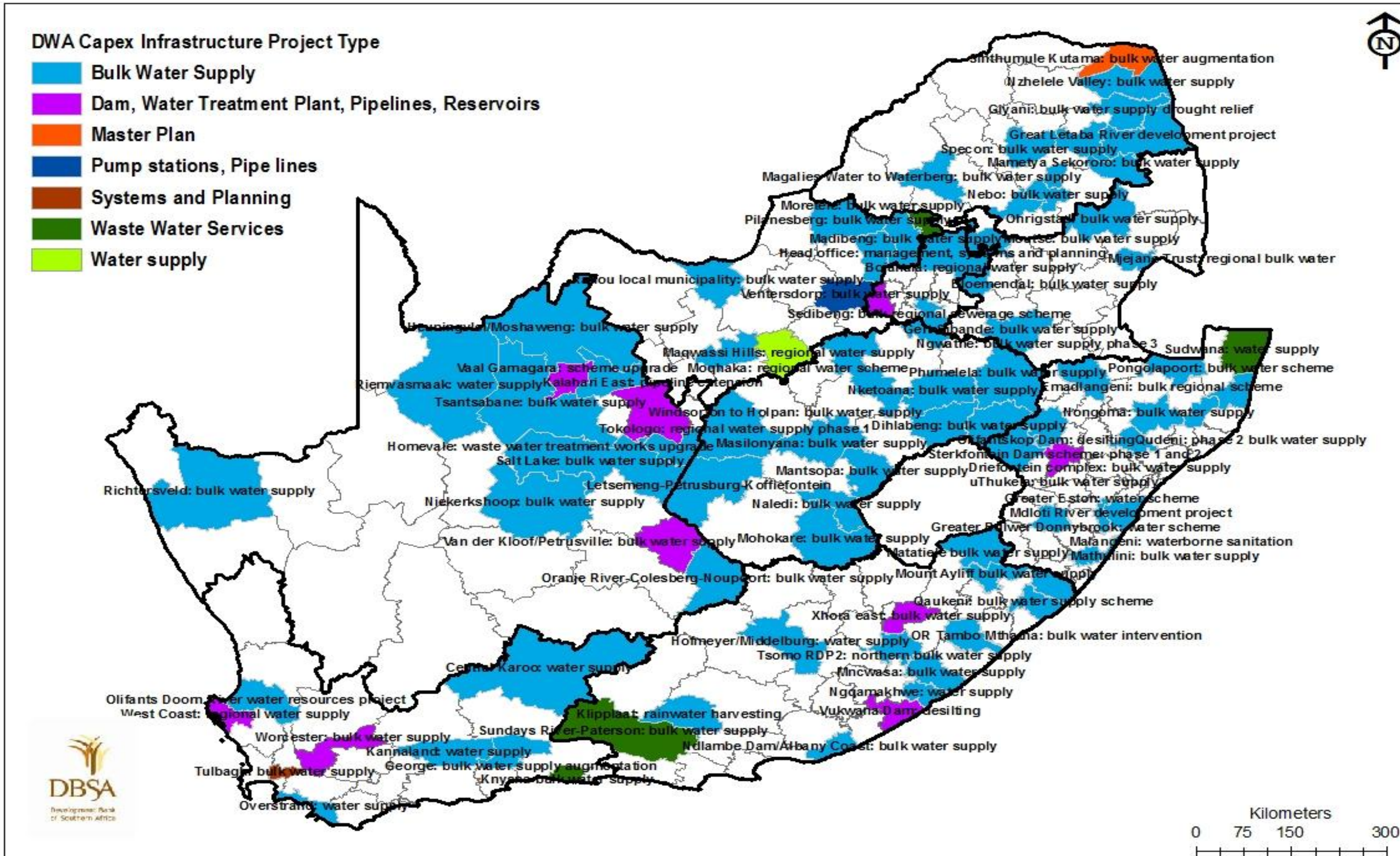
Province	EASTERN CAPE		
Location	Nelson Mandela Bay		
Sum of Amount	**Column Labels**		
Row Labels	**2010/11**	**2011/12**	**2012/13**
AGRICULTURAL ASSETS			
Agricultural Assets			
BIOLOGICAL ASSETS			
Biological Assets			
COMMUNITY	**333377**	**170681**	**126232**
Clinics	14851	19154	28032
Community Halls			
Establishment of Parks & Gardens	16673	[illegible]	[illegible]
Libraries	[illegible]	9700	6800
Museums & Art Galleries	13100	15000	8000
other - community	3600	18800	11800
Recreational Facilities	110408	75227	30800
Sportsfields	164545	26500	19000
HERITAGE ASSETS	**1000**	**3000**	
Heritage Assets	1000	3000	
INFRASTRUCTURE	**1620049**	**2399611**	**2408102**
Car Parks, Bus Terminals and Taxi Ranks			
Electricity Reticulation	258636	226537	248141
Gas			
Housing	2500	3000	3000
Other - infrastructure	2418	8125	31311
Refuse sites	16374	18547	19871
Roads, Pavements, Bridges & Storm Water	898856	1402190	1516143
Sewerage Purification & Reticulation	275065	384924	359250

Public Capital expenditure per project geo coded per local authority area.



Department	Water Affairs			
Type of Infrastructure	(All)			
Sum of Amount	**Column Labels**			
Row Labels	**2007/08**	**2008/09**	**2009/10**	**201**
Buffalo City Metro	**900**	**500**		
Great Kei River Basin: water supply sc	900	500		
Vukwana Dam: desilting				
City of Tshwane Metropolitan Mu ality	**3973**	**2799**	**16085**	**2**
Head office: management, syster d planning	3973	2799	16085	
Nkangala: bulk water scheme				
EC103: Ikwezi				
Klipplaat: rainwater harvestin				
EC105: Ndlambe	**600**			
Ndlambe Dam/Albany Coast: bulk water supply (Grahamstown and Port Alfred augmentation)	600			
EC106: Sunday's River Valley	**18000**	**0**	**0**	**1**
Sunday River: government water scheme, Lower Sundays	0	0	0	
Sundays River-Paterson: bulk water supply	18000			
EC121: Mbhashe	**3700**	**4300**	**6393**	**2**
Idutywa east: water supply	600			
Mncwasa: bulk water supply	3100	4300	6393	
EC122: Mnquma	**1100**	**3800**	**3082**	**1**
Ibika: water supply	600	3200	3082	
Ngqamakhwe: water supply	500	600		
EC131: Inxuba Yethemba			**6325**	**1**
Chris Hani district municipality cluster 4: bulk water supply			3113	
Chris Hani district municipality cluster 9: bulk water supply			3212	
EC132: Tsolwana	**1000**			
Hofmeyer/Middelburg: water supply	1000			
EC134: Lukanji	**1000**	**11650**	**26627**	**1**

DWA Capex per project type



Total water project cost per local authority area