



Summerhill Solar Farm

City Innovation and Sustainability

2020 Carbon and Water MAP

By 2020 Newcastle City Council will achieve:

30% Reduction in Council's electricity usage

30% of NCC electricity supplied from low carbon sources

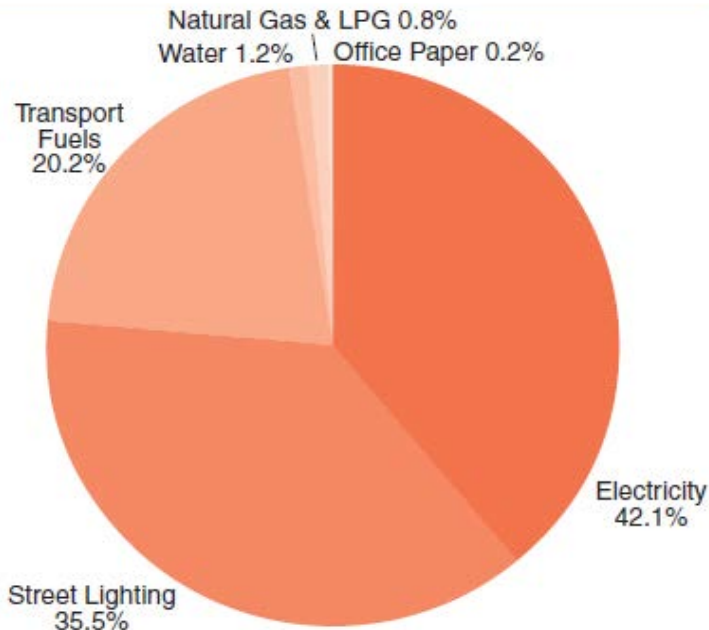
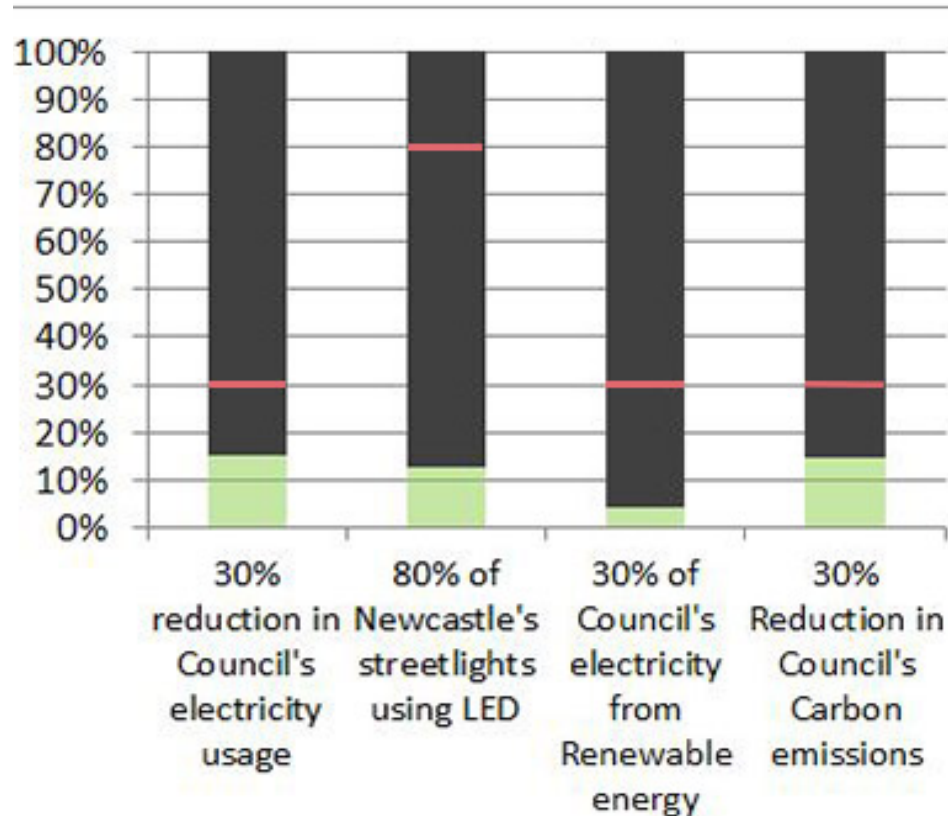


Figure 13: The City of Newcastle- Scope 1, 2 & 3 Emissions In 2008/09 excluding Summerhill WMC

Current Progress Toward 2020 targets



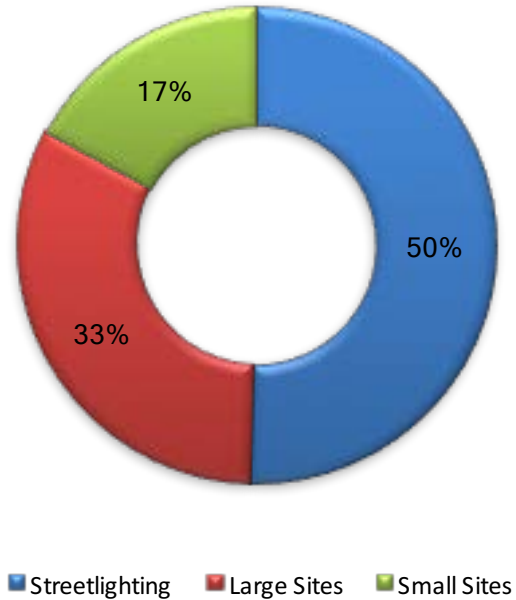
Renewable Energy Systems

LOCATION	System size (kW)	Electricity generated (kWh) pa
War Memorial Cultural Centre	44.28	64,000
Regional Art Gallery	86.25	124,000
Wallsend Library	80.08	115,000
No.1 Sportsground	10.2	14,800
No.2 Sportsground	20.16	30,000
New Lambton Library	9.9	14,300
City Works Depot	91.26	132,600
Newcastle Regional Museum	99.75	146,200
Summerhill Small Wind Turbine	2.5	1400
TOTAL	444.38kW	642,300kWh

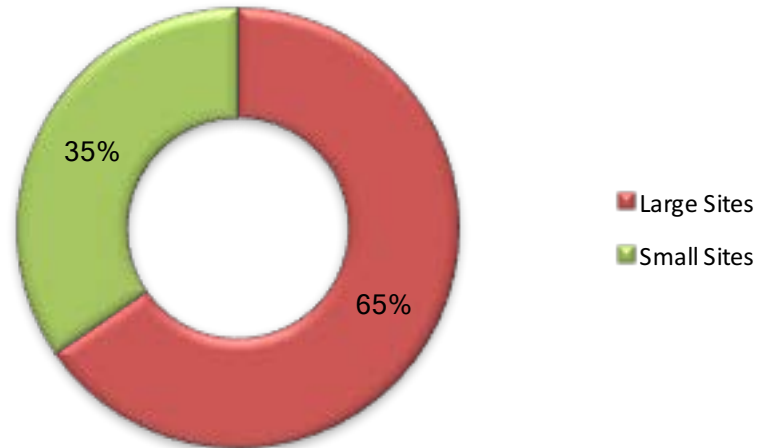


Reaching Our Renewable Targets

Council Electricity Consumption



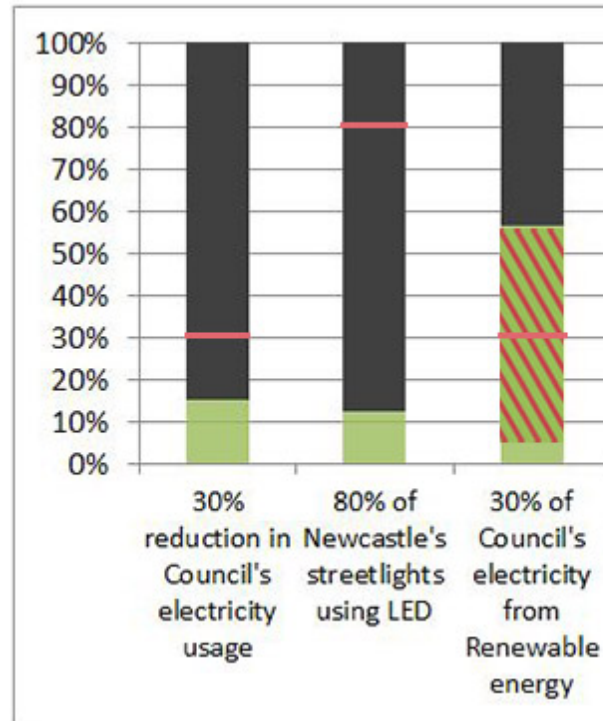
Council operated sites



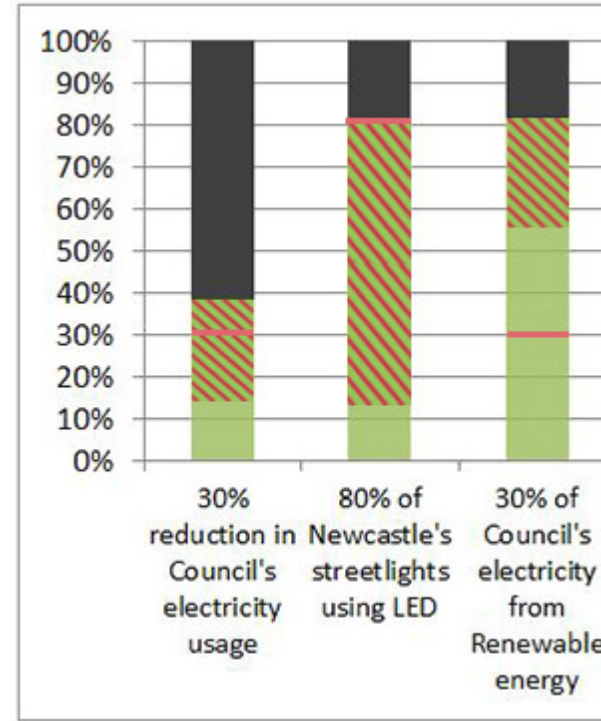
The City of Newcastle 5MW Landfill Solar



Impact of Project towards targets



Solar Farm Impact



Combined with Street Lighting Upgrade

Council is Committed to Electricity Spend



- By necessity Council is a big electricity user
 - Key to providing core service offering
- *Committed* to electricity spend of \$22m over 25 years
- Solar is an alternative option in spending that capital
 - Plan to offset equivalent amount of Council load
- The question is not if, but how Council choose to use Capital
- Therefore a cost replacement Project

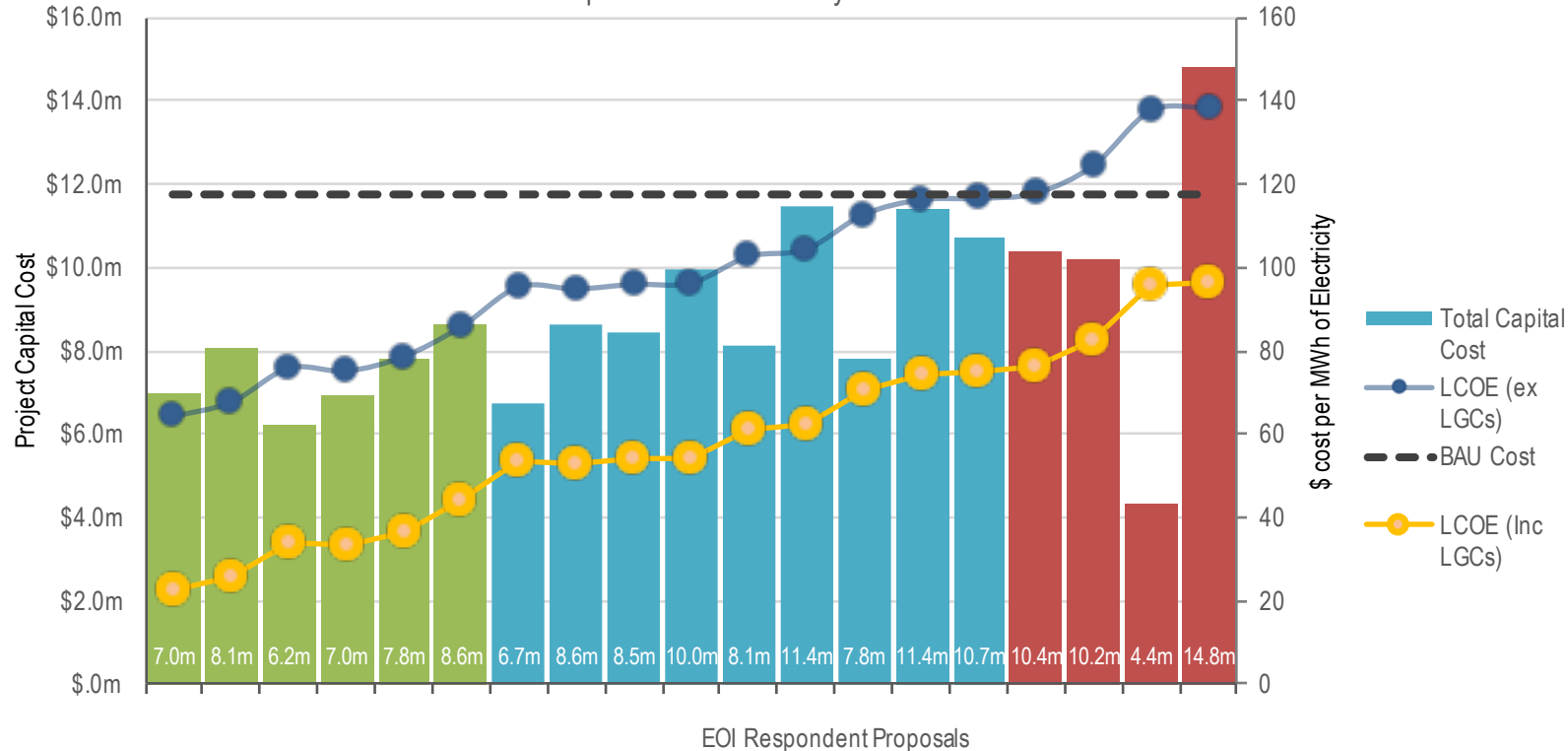
Market tested assumptions via EOI

November 2016 - 18 Responses received
with a total of 20 different proposal options

Category	Range	Median	Previous Council Assumption
Total Capital Investment Required	\$4.4m - \$14.8m	\$8.5m	\$7.81m
Cost Per MW Installed	\$1.2m - \$3.0	\$1.9	\$1.8
O&M Cost Per MWh	\$6.2 - \$219.1	\$18.4	\$16.5-18.00
Levelised Cost Of Electricity (Excluding LGCs)	\$64 - \$138	\$96	\$93
Levelised Cost Of Electricity (Including LGCs)	\$22 - \$97	\$54	\$49

Range of Capital Costs and cost of Electricity

Capital Cost vs Electricity Cost Sorted



Very different to a Commercial Project

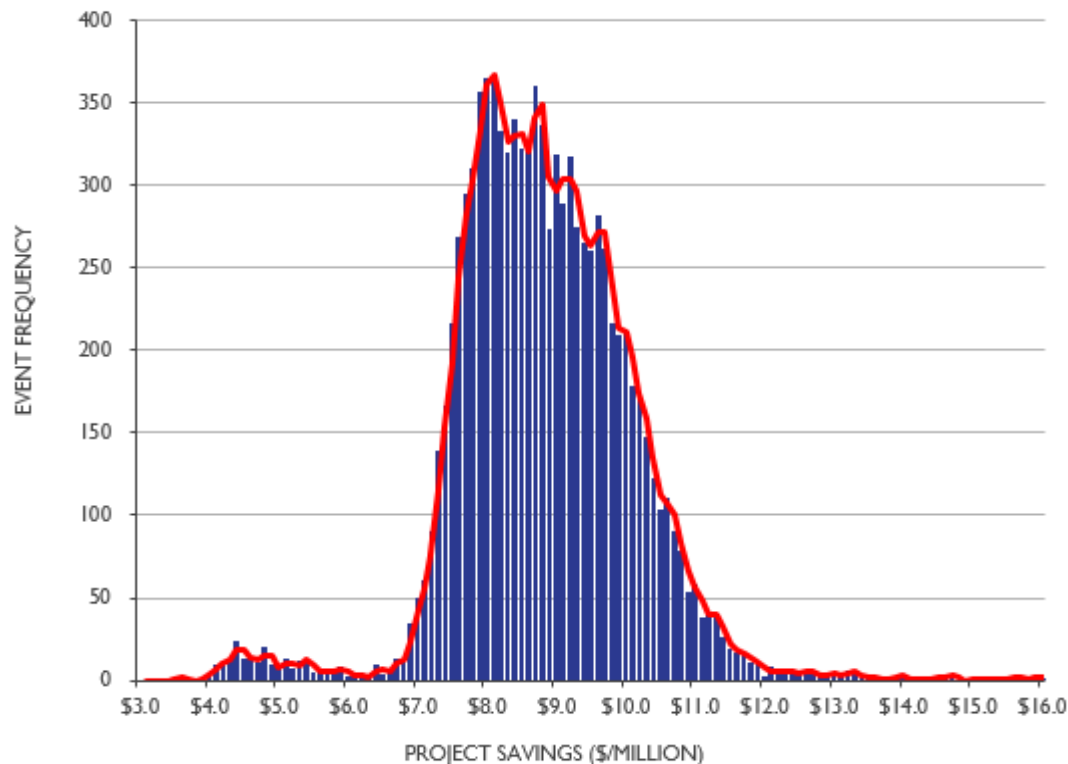
- Council would be it's own customer
 - Removes margin and credit risk
- Council owns the site
- Not a selective use of capital
 - Council is committed to spend \$22.5m - not a choice
- Council has:
 - Sub commercial borrowing costs
 - No excess return requirement
 - A longer term view than a commercial player
- Council values economic, social and environmental benefits

Project 25 year Cost vs Business As Usual

Category	BAU 25 Year NPC	Summerhill Project	Diff
COST OF ELECTRICITY SUPPLY	\$(22.5)m	\$(12.1)m	\$10.4m
EXCESS GENERATION EXPORT REVENUE			
ELECTRICITY TRADING COST			
LGC REVENUE			
PLANT BUILD AND DEVELOPMENT			
PLANT OPERATIONS & MAINTENANCE			
END OF LIFE ASSET VALUE			
TOTAL	\$(22.5)m	\$(14.7)m	\$7.8m

Projected
Budget savings
after repayment
of capital and
operational
costs

Lifetime project savings above repayment costs



Mean saving in
simulation trials
was \$8.9m

Likelihood of
loss to Council
was <1%

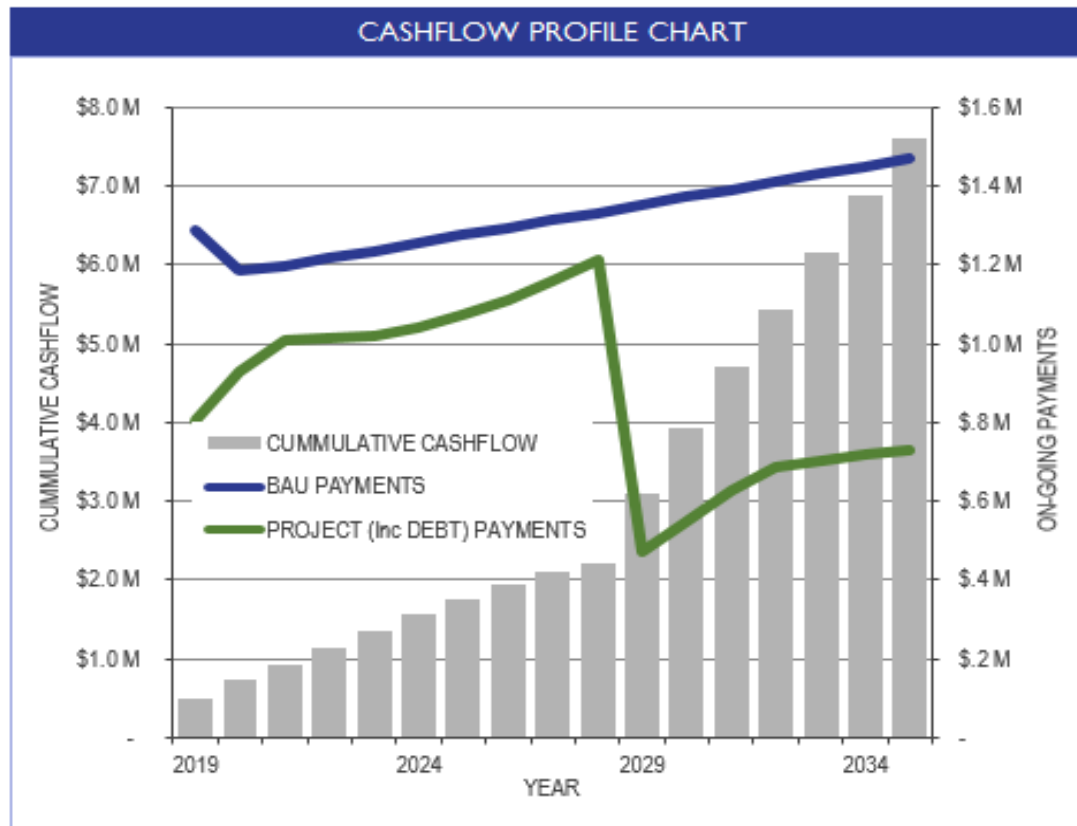
Project Positives

- Net saving on annual electricity cost from year 1
- Self financing with zero rate payer impact
- Scope to be cashflow positive from year 1
 - Even allowing for debt cost
- Drive a number of policy aims
- Leverage the environmental and social positives
 - Strong land re-use story
 - Engage schools/community on the environmental positives
 - Stronger academic ties with on-site research

Funding Model

- Owned and Operated by Council, sited on Council Land
- 20% Equity and 80% Loan Financing
- Utilising CEFC Local Government fund with a 10-year fixed price loan
- Revenue structured to meet both Capital repayments and O&M (which is through an initial 3-year contract with the Design and Construct contractor)
- Cashflow positive each year of 10-year repayment profile
- Intention to utilise more electricity onsite in future.

Project Cashflow vs BAU

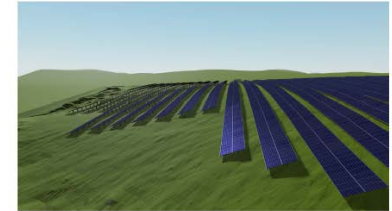
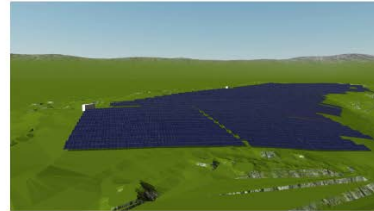
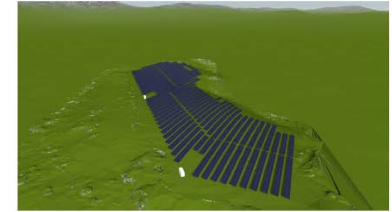
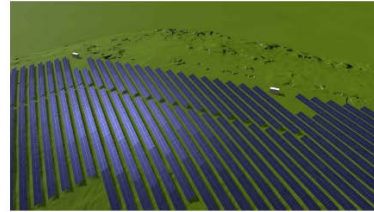
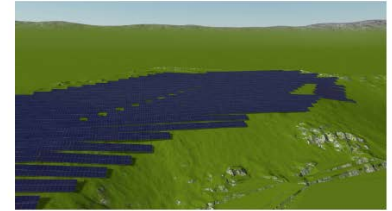
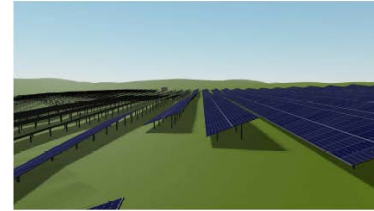


Project Outcomes

- Over 7 GWh of new renewable energy annually
- A good financial outcome for the City when compared against current electricity costs
- Creation of construction jobs and ongoing employment opportunities
- Using impaired land as opposed to greenfield sites
- Provides the blue-print as other landfill cells are closed and additional renewable energy generation opportunities become available
- Future operation of a fleet of electric garbage vehicles and disaster recovery planning through providing power to deployable battery storage containers.

Moving Forward

1. Conducted Tender October 2017
2. Received Council approval
December 2017
3. Received Development Approval
February 2018
4. Reached Financial Close with
CEFC February 2018
5. Awarded Design and Construction
Contract February 2018
6. Beginning Construction works
November/December 2018



Complementary Projects

1. Upgrade of street lighting
2. Continued roll out of behind meter solar and battery storage
3. Smart Cities program
4. Regional energy procurement approach for next contracting
5. Conversion of Council fleet to electric and investigation of future electric garbage vehicle fleet.



Preparing for Construction

