

BENEFITS OF DISTRICT ENERGY SYSTEMS

Reduction of greenhouse gas emissions

- ▶ Energy efficiency improvements
- ▶ Easy to integrate renewable energy sources

Saving money

- ▶ Load diversification lowers required plant capacity
- ▶ System efficiency and reduced maintenance costs

Community energy security

- ▶ District energy systems typically use more than one energy source
- ▶ Utilize renewable energy sources
- ▶ High percentage of backup capacity

Technical Viability

- ▶ Potential opportunity exists with the ice arena, pool and nearby schools
- ▶ Recovering heat from the ice arena would complement the pool's new solar water heating system
- ▶ Planned expansion of recreation centre

Financial Viability

- ▶ Very short payback time for a small-scale district energy system linking the pool and ice rink. The system could then incrementally expand to include nearby schools, and potentially beyond.
- ▶ No other significant district energy opportunities stand out in Rutland at present

Risks and Risk Mitigation

- ▶ No significant risks identified

ORCHARD PARK OPPORTUNITIES

Comments from our
stakeholder workshop Oct 8.

Technical Viability

- ▶ Significant future residential development will occur along the southern and northern edges of this area. Medium density residential development will also occur in the Benvoulin area.
- ▶ Existing shopping facilities cannot easily be retrofitted
- ▶ The planned RackForce Data Centre (GigaCenter), will have an excess heating load. Data centres operate continuously and offer great potential for district energy.
- ▶ Preferred strategy: one or two smaller district energy systems which can incrementally grow over time.
- ▶ Potential to recover waste heat from Landmark office complex (which already shares heat) and redistribute it to the Parkinson Recreation Centre. Piping could be slung underneath the new planned pedestrian/bicycle bridge spanning the highway.
- ▶ City Yards could be a potential future location for an energy centre, supplying energy to the area

Financial Viability

- ▶ The GigaCenter opportunity stands out as a clear opportunity.
- ▶ No consensus on the business case for the Benvoulin Area.

Risks and Risk Mitigation

- ▶ Data centres run continuously with their own backup energy sources. Based upon economic conditions, data centres have been known to relocate. The area should not rely solely on one energy source.

Technical Viability

- ▶ **Concentrated Demand:** Institutional buildings represent large demand for heating. A significant amount of new residential construction is planned.
- ▶ **Energy-Sharing Opportunities:** Some high-rise towers will require cooling, while others will require heating.
- ▶ Peller Estates, Sun-Rype and Tolko interested in potentially participating in a district energy system that would supply the City Centre with waste heat from their operations. Nearby ice arenas could also supply waste heat to this system.
- ▶ Tolko has a cogeneration facility on site, producing electricity & heat from biomass.
- ▶ Federal Government approval required for use of Okanagan Lake water for cooling

Financial Viability

- ▶ An economic incentive may be required to justify the up-front investment required to recover waste heat energy from industrial processes
- ▶ New multi-unit residential construction is likely necessary to ensure financial viability

Risks and Risk Mitigation

- ▶ The lumber mill may move location in future, but not a serious risk (e.g. cogeneration plant could remain)

PANDOSY TOWN CENTRE OPPORTUNITIES

Comments from our
stakeholder workshop Oct 8.

Technical Viability

- ▶ Strong potential for incremental district energy development
- ▶ Combine systems within area for load sharing, with the hospital at one end of the zone and the City's wastewater treatment facility at the other end (distance 1 km)
- ▶ An Energy & Carbon Management Plan (i.e. prefeasibility study) would be required.
- ▶ Piping could be installed along Pandosy street.
- ▶ System could use either the lake or the ground during the cooling season.
- ▶ Two large multi-unit residential buildings are planned, one including a commercial component. Existing campground / trailer park at the corner of Watt Rd and Lakeshore is also slated for future redevelopment.

Financial Viability

- ▶ Financing the system would be challenging. Revenue would have to be recovered over a long period of time.
- ▶ Predicted energy savings indicate a compelling business case, even without considering carbon credits.

Risks and Risk Mitigation

- ▶ Low risk with the proposed energy source, i.e. heat recapture from wastewater treatment facility effluent. The facility is always running and has backup power systems.

Renewable District Energy

November 10, 2009

DRAFT OFFICIAL COMMUNITY PLAN MAP



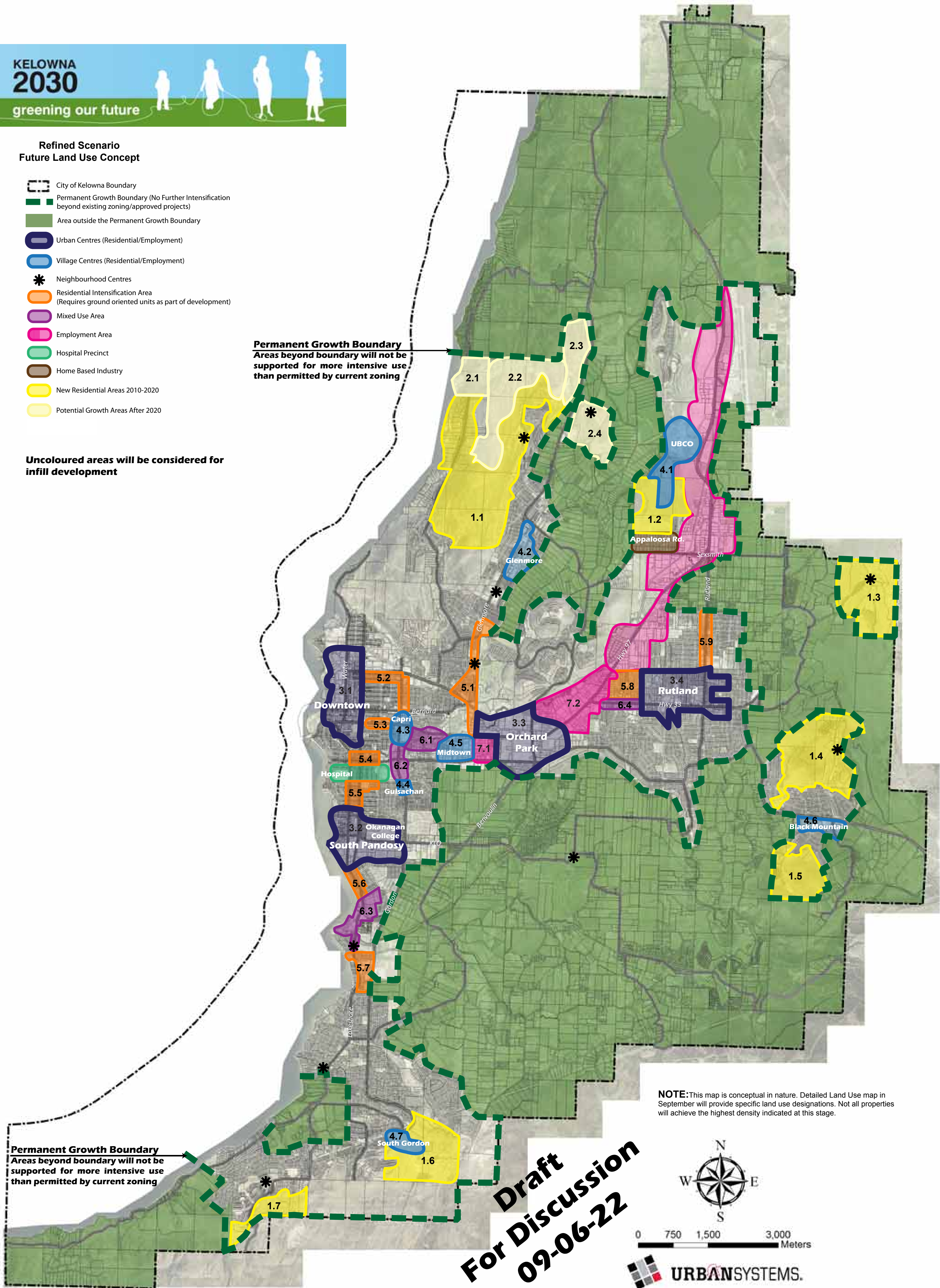
Refined Scenario Future Land Use Concept

- City of Kelowna Boundary
- Permanent Growth Boundary (No Further Intensification beyond existing zoning/approved projects)
- Area outside the Permanent Growth Boundary
- Urban Centres (Residential/Employment)
- Village Centres (Residential/Employment)
- Neighbourhood Centres
- Residential Intensification Area (Requires ground oriented units as part of development)
- Mixed Use Area
- Employment Area
- Hospital Precinct
- Home Based Industry
- New Residential Areas 2010-2020
- Potential Growth Areas After 2020

Uncoloured areas will be considered for infill development

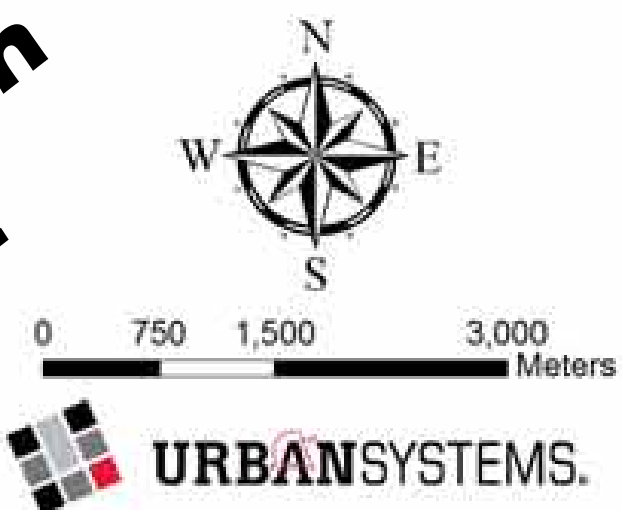
Permanent Growth Boundary
Areas beyond boundary will not be supported for more intensive use than permitted by current zoning

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Areas beyond boundary will not be supported for more intensive use than permitted by current zoning



NOTE: This map is conceptual in nature. Detailed Land Use map in September will provide specific land use designations. Not all properties will achieve the highest density indicated at this stage.

**Draft
For Discussion
09-06-22**



URBANSYSTEMS.

Renewable District Energy

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DRAFT COMMUNITY PLAN POLICIES

Building Performance and Site Planning

- ▶ Improve the energy efficiency and environmental performance of new buildings.

Energy Efficiency. Require green building and/or increased energy efficiency measures for all comprehensive development projects at the time of rezoning through covenants or development agreements.

Building Design/Features. Encourage building design, orientation and features that reduce energy needs, including the use of local or recycled materials, water conservation in landscaping and alternative energy.

Heat Recovery. For mixed use development projects that include significant refrigeration systems, require, where feasible, waste heat recovery for space heating.

District Energy System. Where a district energy system is in place or is planned, implement a Service Area Bylaw to ensure new buildings in the service area are required to connect to the district energy system.

Eco-Industrial Network. Encourage networks of industrial and support businesses to build efficiencies in energy resource use and waste management.

Renewable Energy. Reduce reliance upon fossil fuels and energy sources derived from fossil fuels by promoting and supporting renewable energy infrastructure and the purchase of energy supplied from renewable sources.

DRAFT COMMUNITY PLAN POLICIES

City Infrastructure

- ▶ Integrate infrastructure systems to achieve multiple sustainability objectives.

Resource Recovery. Require resource recovery planning as a driving component of infrastructure projects and facilities to maximize opportunities for recovery of material, gas, heat and energy from the co-management of water systems and solid and liquid waste.

- ▶ Implement efficient and/or renewable energy heating and cooling infrastructure.

District Energy System. Require a district energy system to be constructed and operated where density and site layout allows for a system to be viably operated.

Solar Energy. Support the provision of solar hot water and air systems in residential, commercial, industrial and institutional buildings in collaboration with SolarBC's pilot programs on certification of installers and systems.

Renewable Power. Support the use of small-scale, locally generated, zero carbon renewable power in new and existing developments.