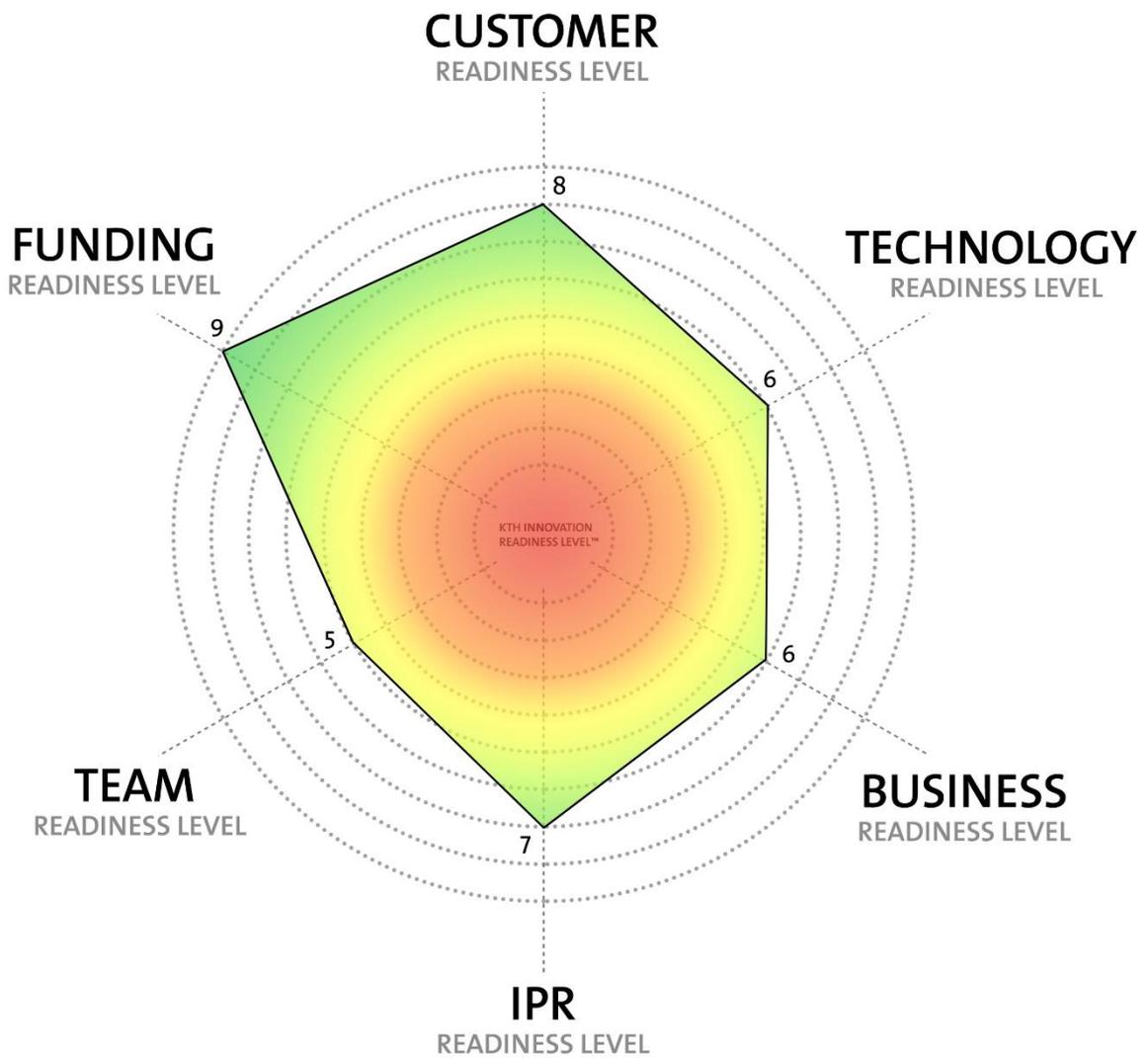


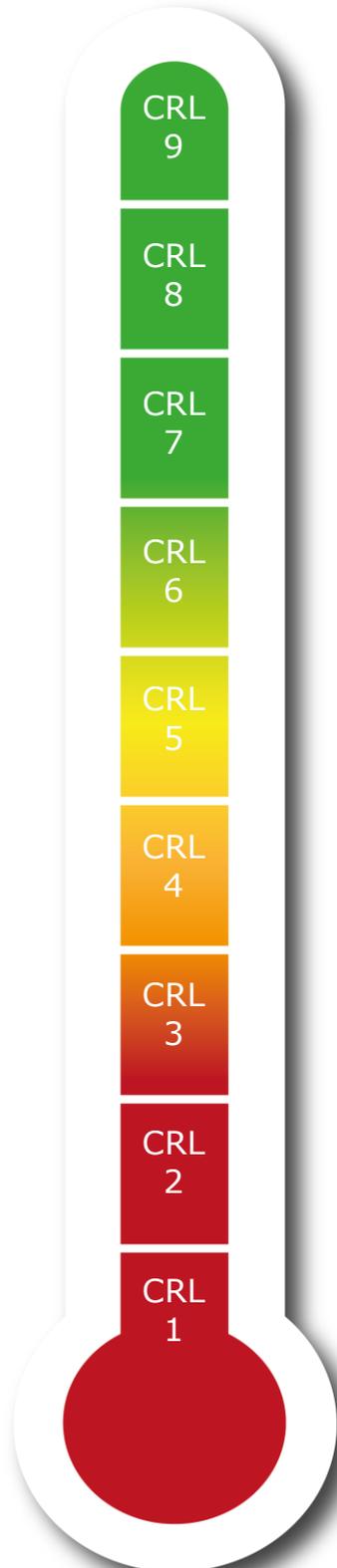


# KTH INNOVATION READINESS LEVEL™





# Customer Readiness Level – CRL



Widespread product sales that scale.

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First products sold and increased structured sales efforts.

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Customers in extended product testing or first test sales

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Benefits of the product confirmed through partnerships or first customer testing.

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Established interest for product and relations with target customers.

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Confirmed problem/needs from several customers or users

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First market feedback established.

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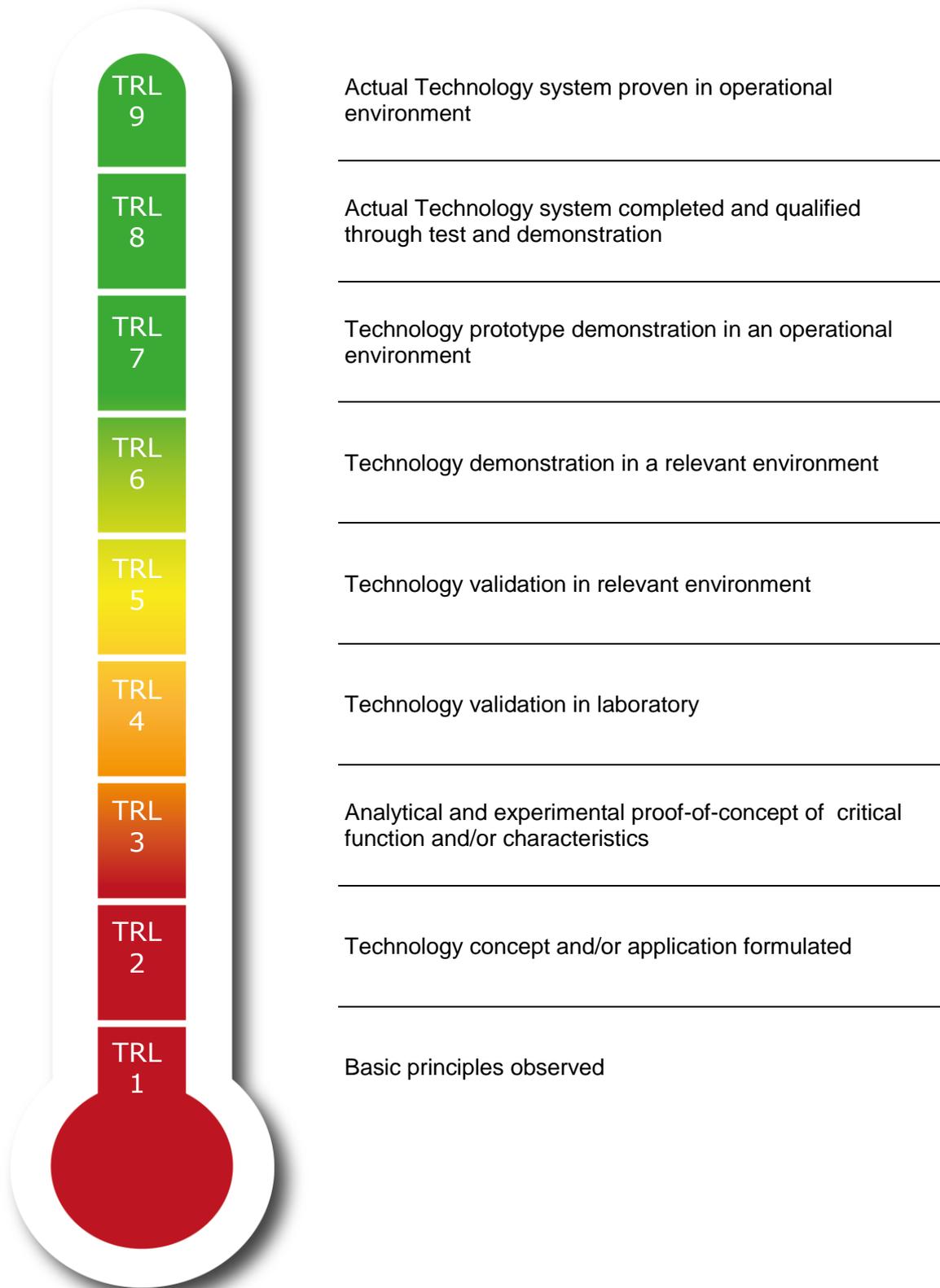
Identified specific needs in market.

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Hypothesizing on possible needs in market.

Level	Description
9	<ul style="list-style-type: none"> <li>- Widespread product deployment, sales to several customers in a repeatable and scalable way.</li> <li>- Customer creation- company focuses on execution with growth of sales and efforts to build user/customer demand etc.</li> </ul>
8	<ul style="list-style-type: none"> <li>- Customer qualifications are complete and initial products are sold to a few customers.</li> <li>- Payment willingness confirmed from sufficient % of customers (product-market fit validated).</li> <li>- The real buyers/economic decision makers are identified.</li> <li>- Business development and sales mature and adapt to support larger scale sales efforts (e.g. clear sales process/organization, CRM systems etc)</li> </ul>
7	<ul style="list-style-type: none"> <li>- Customer agreements in place- first sales and/or test sales of product versions take place (customer validation to show initial product-market fit).</li> <li>- Customers and relevant stakeholders engaged in product qualifications/extended testing.</li> <li>- Ramp up of business development and sales efforts according to sales process and roadmap.</li> </ul>
6	<ul style="list-style-type: none"> <li>- Testing of product by customers/users where the value and benefits of the product is confirmed (validated problem-solution fit).</li> <li>- Partnerships formed with key stakeholders in value chain (e.g. partners, pilot customers).</li> <li>- Initiated structured business development/sales activities. First sales process/roadmap defined</li> </ul>
5	<ul style="list-style-type: none"> <li>- General interest from customers/users for the product where the possible product/solution (core features) is confirmed to solve customers' problems (i.e. initial problem-solution fit)</li> <li>- Existing contacts strengthened and/or more contacts established with additional customers. Deeper understanding of the market is achieved. Target customers are identified</li> <li>- Established relationships with potential target customers, users or partners e.g. providing input on requirements and initial prototypes (e.g. resulting in updated product hypothesis).</li> <li>- Defined who the target customers/segments are to be focused on as entry/first customers.</li> </ul>
4	<ul style="list-style-type: none"> <li>- Contacts and feedback are established with several possible customers/users. Numbers are typically limited but depend on B2B/B2C and market structure (e.g. 5-10 in B2B, if market is concentrated 2-5 market leading customers, in B2C higher e.g. 10-20).</li> <li>- The problem and need (and its importance) is confirmed from multiple customers/users</li> <li>- Customer segmentation in place, knowledge of customers/users has increased level of details</li> <li>- A primary product hypothesis is defined, possibly based on feedback.</li> </ul>
3	<ul style="list-style-type: none"> <li>- Initiated customer discovery with feedback from primary market research i.e. direct contacts e.g. a few possible users/customers or persons with industry/market knowledge (experts)</li> <li>- A more developed understanding of possible customers and possible customer segments</li> <li>- A more clear problem hypotheses</li> </ul>
2	<ul style="list-style-type: none"> <li>- Some market research is performed, typically derived from secondary sources.</li> <li>- Brief familiarity with the market, possible customers and their problems/needs.</li> <li>- There is a more clear and more specific problem/need description</li> <li>- Product/solution ideas may exist, but are not clear and typically speculative and unvalidated</li> </ul>
1	<ul style="list-style-type: none"> <li>- Thinking (yourself) that a possible need/problem or opportunity might exist in a market.</li> <li>- No clear hypotheses on who customers are and what problems are etc. If hypothesis exist they are unclear, speculative and there is no proof or analysis to support assumptions.</li> <li>- Limited or non-existing knowledge of the market and customers/users (who they are etc)</li> </ul>

# Technology Readiness Level – TRL



Level	Description
9	<ul style="list-style-type: none"> <li>- Actual application of the technology in its final form and under mission/operational conditions, such as those encountered in operational test and evaluation. Technology is ready for commercial deployment.</li> <li>- Software: readily repeatable and reusable. The software based on the technology is fully integrated with operational hardware/software systems. All software documentation verified. Successful operational experience. Sustaining software engineering support in place.</li> </ul>
8	<ul style="list-style-type: none"> <li>- Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development</li> <li>- Software fully integrated with operational hardware and software systems, development documentation is complete. All functionality tested in simulated and operational scenarios.</li> </ul>
7	<ul style="list-style-type: none"> <li>- Prototype near or at planned operational system. Requiring demonstration of an actual system prototype in an operational environment (e.g., in an aircraft, in a vehicle, or in space). Normally only performed when the technology and/or subsystem is mission critical and relatively high risk.</li> <li>- Critical technological properties are measured against requirements in an operational environment.</li> <li>- Readiness in an operational environment requires evidence of the acceptable performance under operational factors, including, for example for a software system loading, user interaction, security etc.</li> </ul>
6	<ul style="list-style-type: none"> <li>- Representative model or prototype system, tested in a relevant environment. Represents a major step up and requires evidence of performance on full-scale, realistic problems.</li> <li>- For software: level at which the engineering feasibility of a software is demonstrated. This level extends to laboratory prototype implementations on full-scale realistic problems in which the software technology is partially integrated with existing hardware/software systems.</li> <li>- Examples: testing a prototype in a high-fidelity lab environment or simulated operational environment.</li> </ul>
5	<ul style="list-style-type: none"> <li>- Basic technological components integrated with reasonably realistic supporting elements so they can be tested in a simulated environment. Fidelity of breadboard technology increases significantly.</li> <li>- Integrated components provide a representation of a system/subsystem for to determining concept feasibility and to develop technical data. Lab use to validate the technical principles of interest.</li> <li>- Software: Module and/or subsystem validation in relevant environment. Ready to start integration with existing system, conforms to target environment/interfaces. System software architecture established and all components and elements affecting the operation of the critical software element.</li> <li>- Examples: a new type of solar photovoltaic material promising higher efficiencies used in an actual fabricated solar array that would be integrated with power supplies, supporting structure, etc., and tested in a thermal vacuum chamber with solar simulation capability.</li> </ul>
4	<ul style="list-style-type: none"> <li>- Basic technological components are integrated to establish that they will work together. This is relatively “low fidelity” compared with the eventual system. System concepts considered and results from testing laboratory scale breadboard(s). Only limited and initial information about the end product function.</li> <li>- Software: module and/or subsystem validation in a laboratory environment (i.e. software prototype development environment). Basic software components are integrated to establish that they will work together. Architecture development initiated (e.g. interoperability, reliability).</li> <li>- Example: demo of a ‘fuzzy logic’ approach to avionics by testing algorithms in a partially computer-based, partially bench-top components to demo in a controls lab using simulated vehicle inputs.</li> </ul>
3	<ul style="list-style-type: none"> <li>- Active R&amp;D is initiated to develop the technology/product further.. Analytical studies and laboratory-based or experimental studies are performed to physically validate that analytical predictions are correct. Lab tests are performed to measure parameters of interest and compare to analytical predictions.</li> <li>- Software: limited functionality environments to validate critical properties/analytical predictions using non-integrated software components and partially representative data.</li> <li>- Example: super-cooled hydrogen as a propellant where the concept-enabling temperature/pressure for the fluid was achieved in a lab. Software algorithms run on a surrogate processor in lab environment.</li> </ul>
2	<ul style="list-style-type: none"> <li>- The potential technology/product concept is defined and described.</li> <li>- Practical applications can be defined/ researched but are speculative and no proof or detailed analysis.</li> <li>- Software: analytic studies, studies on synthetic data, small code units</li> <li>- Example: observation of high critical temperature superconductivity, potential applications of the new material in instruments (e.g. telescope sensors) defined.</li> </ul>
1	<ul style="list-style-type: none"> <li>- Published research that identifies the basic principles that underlie a technology.</li> <li>- Scientific research begins to be translated into more applied research and development.</li> <li>- Example: studies of basic properties e.g. tensile strength as a function of temperature for a new material</li> </ul>

# Business Readiness Level – BRL



Level	Description
9	<ul style="list-style-type: none"> <li>- Business model is final and business is scaling with growing and recurring revenues.</li> <li>- The business scales by growing in new markets, new geographies, new segments etc.</li> <li>- There is a working business which is profitable and sustainable over time.</li> </ul>
8	<ul style="list-style-type: none"> <li>- Sales and other metrics show the business model holds and is profitable e.g. customer acquisition is not costing too much.</li> <li>- The business model shows it can scale (potentially globally). Sales channels and supply chain are fully in place.</li> <li>- Business model is set but is continuously fine-tuned to explore more revenue options.</li> </ul>
7	<ul style="list-style-type: none"> <li>- There is product/market fit meaning you can demonstrate significant customer interest and use of products and sales where customers show clear payment willingness.</li> <li>- Attractive revenue vs cost projections (being validated by sales and data) implying a sustainable/ attractive business could be built.</li> <li>- Preparations for scaling business with suppliers, sales channels etc (incl. agreements).</li> </ul>
6	<ul style="list-style-type: none"> <li>- A complete business model incl. the pricing is tested vs. customers by test sales or similar.</li> <li>- The revenue model incl. pricing is updated and refined based on customer feedback.</li> <li>- First more complete projections on revenue/costs (profit and loss projections or similar) with more details and well-grounded assumptions/data (e.g. 1-3 years horizon)</li> </ul>
5	<ul style="list-style-type: none"> <li>- The business model (at least parts of it) is tested against customers for verifying hypotheses.</li> <li>- The business model is updated and refined to new version based on customer feedback</li> <li>- There is a first version of a more detailed revenue model incl. pricing hypotheses (what revenue streams are there, from what, when, how and what prices are possible?)</li> <li>- The competitive position and differentiation is verified by market feedback.</li> </ul>
4	<ul style="list-style-type: none"> <li>- There is a full business model in canvas format incl. details on possible revenues/costs.</li> <li>- First economic projections with numbers to show the market potential and economic viability (bottom-up calculations based on projections/guesstimates on volumes, prices etc)</li> <li>- Assessed feasible Share Of Market based on e.g. barriers to entry incl. competition</li> <li>- Made a competitive analysis on your position and uniqueness/differentiation vs them.</li> </ul>
3	<ul style="list-style-type: none"> <li>- There is draft of the business model in a canvas format (business model canvas/lean canvas) but typically without the revenues/cost parts and details of these.</li> <li>- The market description is getting more highly resolved with more specific market applications and segments being identified. Target applications identified.</li> <li>- The market potential and the market size is quantified with TAM and SAM- Segmented/Served Available/Addressable Market (everyone you have decided/can reach)</li> <li>- A more complete competitor overview with direct/indirect competitors and alternatives</li> </ul>
2	<ul style="list-style-type: none"> <li>- Described the proposed business concept in some structured form e.g. NABC</li> <li>- One or several markets or applications are identified and described on overall level e.g. user numbers, TAM- Total Available or Addressable Market (everyone you wish to reach)</li> <li>- Some competitors and/or alternatives are identified and listed</li> </ul>
1	<ul style="list-style-type: none"> <li>- Vague and unspecific description of the potential business idea or business concept</li> <li>- Little insight into the market and its potential/size-hypothesizing on possible applications</li> <li>- Little knowledge or insight into competition and alternative solutions</li> </ul>

# IPR Readiness Level – IPRL



Strong IPR support and protection for business.  
Patent granted in relevant countries and maintained in force

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IPR strategy and IP management fully implemented.  
More complete assessment of freedom-to-operate.

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All relevant IPR filed (e.g. additional patents).  
Patent entry into national/regional phase.

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IPR/patent strategy implemented and supporting business.  
Positive response on filed applications  
Initial assessment of freedom-to-operate (or landscape)

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Draft of IPR/patent strategy in place to use IPR for business.  
Filed first complete patent application (or other IP registrations)

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Confirmed if protection possible and for what (e.g. patentability).  
Decided why to protect certain IPR (business relevance).

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Detailed description of possible key IPR (e.g. invention or code)  
Initial search of technical field and existing IPR.

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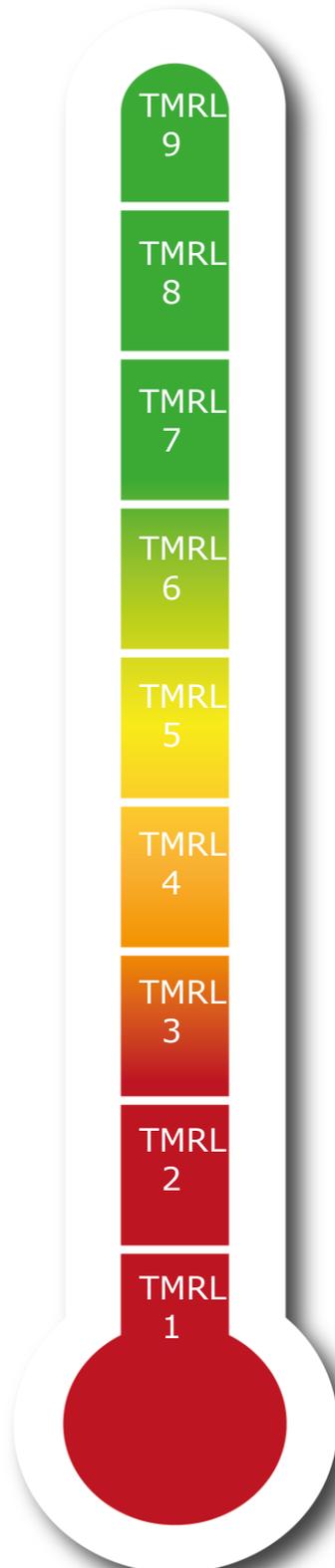
Identified different forms of possible IPR that you have.  
Ownership is clarified and you clearly own/control IPR.

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Hypothesizing on possible IPR you might have (such as patents, software, copyright, designs, trade secrets etc.)

Level	Description
9	<ul style="list-style-type: none"> <li>- Strong IPR support and protection for business, for example using various other forms of registered IPR (trademarks, designs etc) or for example using agreements, trade secrets etc.</li> <li>- Patent granted and maintained in several countries relevant for business</li> <li>- Patent is in force/valid with no invalidation procedures</li> </ul>
8	<ul style="list-style-type: none"> <li>- IPR strategy is fully implemented and managed. IPR is proactively used to support business, for example all IPR related agreements are professionally managed and new IP is managed.</li> <li>- First patent is granted with relevant scope for business</li> <li>- No oppositions encountered for patent grant</li> <li>- More complete assessment of freedom-to-operate</li> </ul>
7	<ul style="list-style-type: none"> <li>- Other forms of relevant IPR might be registered such as trademarks, designs.</li> <li>- Entry into national phase (US, EU, JP etc.)</li> <li>- Complementary or additional new patents might be filed</li> </ul>
6	<ul style="list-style-type: none"> <li>- More full IPR strategy in place that is validated by professional and that really links to and supports business strategy.</li> <li>- Patent strategy in place-identifying possible additional patents, country strategy, claim changes.</li> <li>- Positive response on applications from authorities and analysis of response performed.</li> <li>- If no positive response: analysis is performed together with professional with strong arguments and strategy for prosecution.</li> <li>- Initial assessment of freedom-to-operate (e.g. competitor based, narrowed product scope etc.) or landscaping. Overall purpose to get knowledge on the field, key IPR, players and activity.</li> </ul>
5	<ul style="list-style-type: none"> <li>- Draft IPR strategy- first analysis (preferably by professional) on how different IPR can be used to protect and be of value for the business.</li> <li>- Patent strategy- professional analysis on what/how to patent and how to improve/build value of patent application (e.g. supporting data, new/additional details to be filed etc.)</li> <li>- Basic agreements in place to ascertain control of IPR (e.g. assignments, ownership copyright)</li> <li>- First complete patent application (or other IPR registration) filed in cooperation with professional</li> </ul>
4	<ul style="list-style-type: none"> <li>- Confirmed novelty and patentability through searches/analysis by professional</li> <li>- Confirmed possibilities for protecting other forms of IPR</li> <li>- Possibly filed “provisional” patent application i.e. not professionally drafted and complete</li> <li>- Analyzed (ideally with professional) the key IPR and what the priorities should be for what to protect (e.g. patent). Decided on alternative forms of protection if patents are not suitable.</li> </ul>
3	<ul style="list-style-type: none"> <li>- Considered what forms of IPR are key and could/should be protected ( e.g. through patents)</li> <li>- Sufficiently detailed description of possible IPR and patentable inventions (invention disclosure)</li> <li>- Made own searches/analysis of publications, state-of- the art solutions etc.</li> <li>- Possibly initial searches by professional to find prior art within patent databases</li> </ul>
2	<ul style="list-style-type: none"> <li>- Mapped different forms of IPR that exist or could emanate during development</li> <li>- Specific ideas for patenting exist, but are not well described and defined.</li> <li>- Agreements related to IPR are identified and ownership is clarified. IPR is verified to be under your ownership or control. Inventors are clarified. Knowledge of applicable IP policies etc.</li> </ul>
1	<ul style="list-style-type: none"> <li>- Hypothesizing results or ideas might contain possible patents or some other form of IPR</li> <li>- Some ideas on IPR e.g. for patenting may exist, but are speculative and uniqueness etc. not clear.</li> <li>- Vague description and documentation of the possible IPR</li> <li>- Limited knowledge or unclarities regarding relevant legal agreements (ownership, use-rights etc.)</li> <li>- Limited or non-existing knowledge of the technical field, state-of-the art, publications etc</li> </ul>

# Team Readiness Level – TMRL



High performing, well-structured team and organization that is maintained and performs over time.

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Management and CEO in place. Professional use of board/advisors. Activated plan and recruitment for building long term team.

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Team and culture is fully in place and proactively developed. Updated plan for building necessary team on longer term.

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Complementary, diverse and committed team with all necessary competencies/resources incl. both business and tech.

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Initial founding team with main needed competencies. Team agrees on ownership and roles and has aligned goals

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A champion is present. Several needed competencies in place. Initiated plan for recruiting or securing additional key resources.

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A few of necessary competencies/resources are present. Defined needed competencies/resources (and plan for finding).

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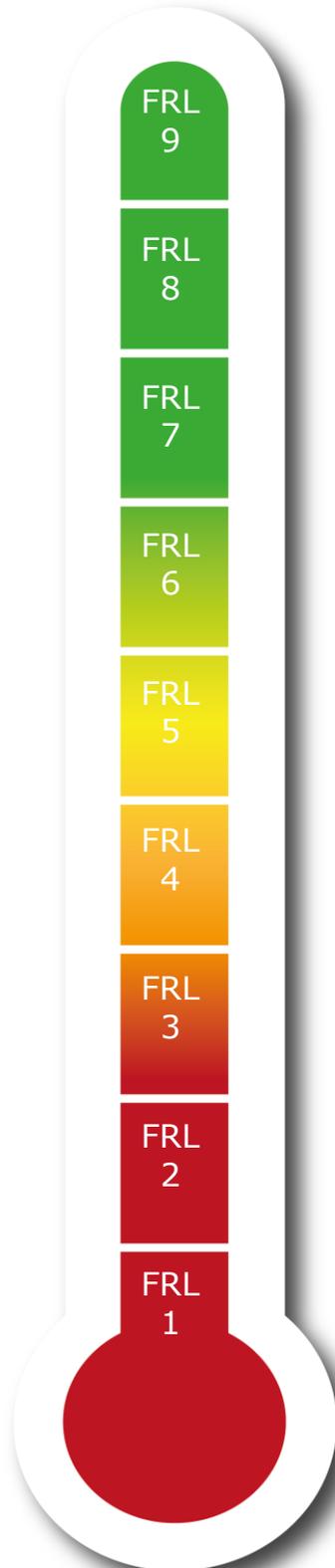
Insight and first idea on necessary competencies or external resources (e.g. partners).

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Little insight into the need for a team (typically an individual) Lack of necessary competencies/resources.

Level	Description
9	<ul style="list-style-type: none"> <li>- The team is high performing and well-functioning (cooperation, social environment etc).</li> <li>- The team is motivated, coached and rewarded to reach goals. Team-building is active.</li> <li>- Strong culture, a clear and functional structure (organization, roles etc) exists with processes etc.</li> <li>- The team is maintained and developed and performs over time</li> <li>- Personnel is developed and trained professionally according to a more long term strategic plan.</li> </ul>
8	<ul style="list-style-type: none"> <li>- There is a clear leadership and management. CEO in place with relevant business experience.</li> <li>- There is a competent board which is professionally used. Relevant advisors are in place and used.</li> <li>- Necessary recruitments according to longer term plan are ongoing to ascertain competencies</li> <li>- The team is properly motivated and rewarded so everyone performs at their max.</li> </ul>
7	<ul style="list-style-type: none"> <li>- Culture is formed and used to develop and support the team and company development</li> <li>- The team is well aligned with shared goals/vision and the team is well functioning with clear roles</li> <li>- The team is proactively developing their skills, cooperation etc. and there is a plan for this.</li> <li>- Some additional recruitment needs might exist. e.g. a new CEO or key technical personnel</li> <li>- There is a plan for necessary recruitments and needed resources over longer term (~2 yrs)</li> </ul>
6	<ul style="list-style-type: none"> <li>- Complementary team in place with technology and business as well as team diversity.</li> <li>- Committed team where everyone is feeling responsibility and accountability.</li> <li>- All key competencies necessary for the near term are present.</li> <li>- Advisors (e.g. advisory board) and/or board members are considered and recruited.</li> <li>- Low dependency on a single individual for specific key skill or expertise</li> <li>- Awareness of risks to team performance (internal conflicts, politics, conflicting agendas/priorities)</li> <li>- Initial recruitment and other activities for securing competence/resources completed successfully.</li> </ul>
5	<ul style="list-style-type: none"> <li>- An initial founding team working together and all spending significant time. The founding team jointly having main needed competencies</li> <li>- Additional team aspects e.g. background and diversity are considered (e.g. balance male/female)</li> <li>- Recruitment or network activities to ascertain additional persons/resources are progressing</li> <li>- The team has agreed on their respective shares (signed agreement). Ownership is balanced and incentivizing and reflects historical and future commitment and contribution.</li> <li>- The team is aligned with clarified roles, shared goals and clear commitment (e.g. time spent)</li> </ul>
4	<ul style="list-style-type: none"> <li>- A champion (driver and committed to take the project forward) is present in the team</li> <li>- Several, but not all, competencies necessary are present, typically multiple individuals in team.</li> <li>- A plan is in place and initiated to recruit persons with defined needed skills (described e.g. in a requirement profile). Activities initiated for ascertaining key resources in e.g. partnerships.</li> <li>- The team has started discussions on ownership as well as roles and commitment going forward</li> </ul>
3	<ul style="list-style-type: none"> <li>- A few of the necessary competencies/resources are present. One or several individuals that possess some, but not all, of necessary competencies/resources.</li> <li>- The existing and needed competencies/resources have been defined and gaps to fill identified.</li> <li>- An initial "Team plan" is put in place for what is most needed near term (&lt;1 year) and how to find these prioritized competencies</li> </ul>
2	<ul style="list-style-type: none"> <li>- Some insight that additional necessary competencies and/or resources (e.g. partners) are needed</li> <li>- First idea on what additional persons, competencies and resources that could be needed</li> <li>- Limited competencies present- typically an individual.</li> </ul>
1	<ul style="list-style-type: none"> <li>- Little insight into needed/necessary competencies (knowledge, skills) and other needed resources (e.g. partners, service providers etc)</li> <li>- Typically an individual lacking the necessary skills in key areas such as technology, business etc.</li> <li>- No consideration or interest to build a team with additional and complementary skills</li> </ul>

# Funding Readiness Level – FRL



FRL 9  
Investment obtained. Additional investment needs and options continuously considered.

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FRL 8  
There is corporate order and structure enabling investment. Term sheet discussions with interested investor(s).

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FRL 7  
Team presents a solid investment case incl. status and plans. Discussions with potential investors on-going around an offer.

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FRL 6  
Improved investor presentation in place incl. business/ financials. Decided on seeking private investors and initial contacts taken

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FRL 5  
Investor oriented presentation and supporting material tested. Applied for and secured additional larger funding (soft or other).

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FRL 4  
Good pitch and short presentation of the business in place. Plan in place with different funding options over time.

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FRL 3  
Well described business concept and initial verification plan. First small soft funding secured.

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FRL 2  
Description of business concept (e.g. NABC). Defined funding needs and funding options for initial milestones.

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FRL 1  
Initial business idea with vague description. No clear view on funding needs and funding options.

Level	Description
9	<ul style="list-style-type: none"> <li>- Investment formally concluded with all relevant documentation and money obtained.</li> <li>- Additional future investment needs and options are continuously being considered for future</li> </ul>
8	<ul style="list-style-type: none"> <li>- The company is reasonably structured e.g. in terms of agreements, ownership (not fragmented or significant parts held by inactive/non-contributing persons) etc.</li> <li>- There is formal order in the company e.g. bookkeeping, documentation etc.</li> <li>- Clear interest and discussions (on term sheet level or similar) with interested investor(s)</li> <li>- All necessary material often required by investors in place (financials, business plan)</li> <li>- Concrete discussions with one or several possible investors that clearly are interested.</li> </ul>
7	<ul style="list-style-type: none"> <li>- There is a team that can present well the investment case where key areas are in place such as prototype, traction/customer interest, market potential with scalability etc.</li> <li>- There is a complete business plan with financials and milestone plan etc in place</li> <li>- Discussions with potential investors are on-going around a defined offer (how much money, for what, conditions, valuation etc)</li> <li>- There is alignment amongst existing team and owners with a shared view on investment</li> </ul>
6	<ul style="list-style-type: none"> <li>- There is an investor pitch deck that has been tested and fine-tuned and which includes a focus on the business potential and financials to attract investor interest.</li> <li>- Insight into equity financing especially how investors think/evaluate, investment criteria etc. Decided to pursue equity funding and take in new owners.</li> <li>- Decided on a first offer to private investors i.e. amount/valuation and use of funds</li> </ul>
5	<ul style="list-style-type: none"> <li>- There is an investor presentation (pitch deck) that has been tested and is being fine-tuned.</li> <li>- Supporting material e.g. financial projections and budgets etc. are being developed</li> <li>- Applications for other types of funding e.g. grants or loans are prepared and filed.</li> <li>- Larger soft funding (e.g. 0.5-1 MSEK is achieved)</li> <li>- Insight into the basics of equity financing and willingness to consider it, i.e. no major fear of losing control/ownership.</li> </ul>
4	<ul style="list-style-type: none"> <li>- A succinct pitch (oral) and good written presentation of business concept is in place</li> <li>- There is a more complete plan for funding needs/options over time (12-18 months) i.e. overall budget and potential sources of funding.</li> </ul>
3	<ul style="list-style-type: none"> <li>- Well described business concept and initial verification plan (incl. hypothesis to verify, goals )</li> <li>- Basic insight and knowledge of different financing options</li> <li>- Obtained first small soft funding (50-200 KSEK) for commercial verification according plan</li> </ul>
2	<ul style="list-style-type: none"> <li>- The business idea/business concept is reasonably well described incl. first version of value proposition (e.g. NABC). The business concept is not verified and updated</li> <li>- The initial funding needs are mapped for initial key steps and milestones i.e. costs/budget</li> <li>- There is a basic plan with funding options for initial milestones (3-6 months)</li> </ul>
1	<ul style="list-style-type: none"> <li>- Initial business idea with unclear/poor description- no value proposition (e.g. NABC)</li> <li>- No insight into how much funding needed and for what.</li> <li>- Little insight into different funding options and funding types.</li> </ul>